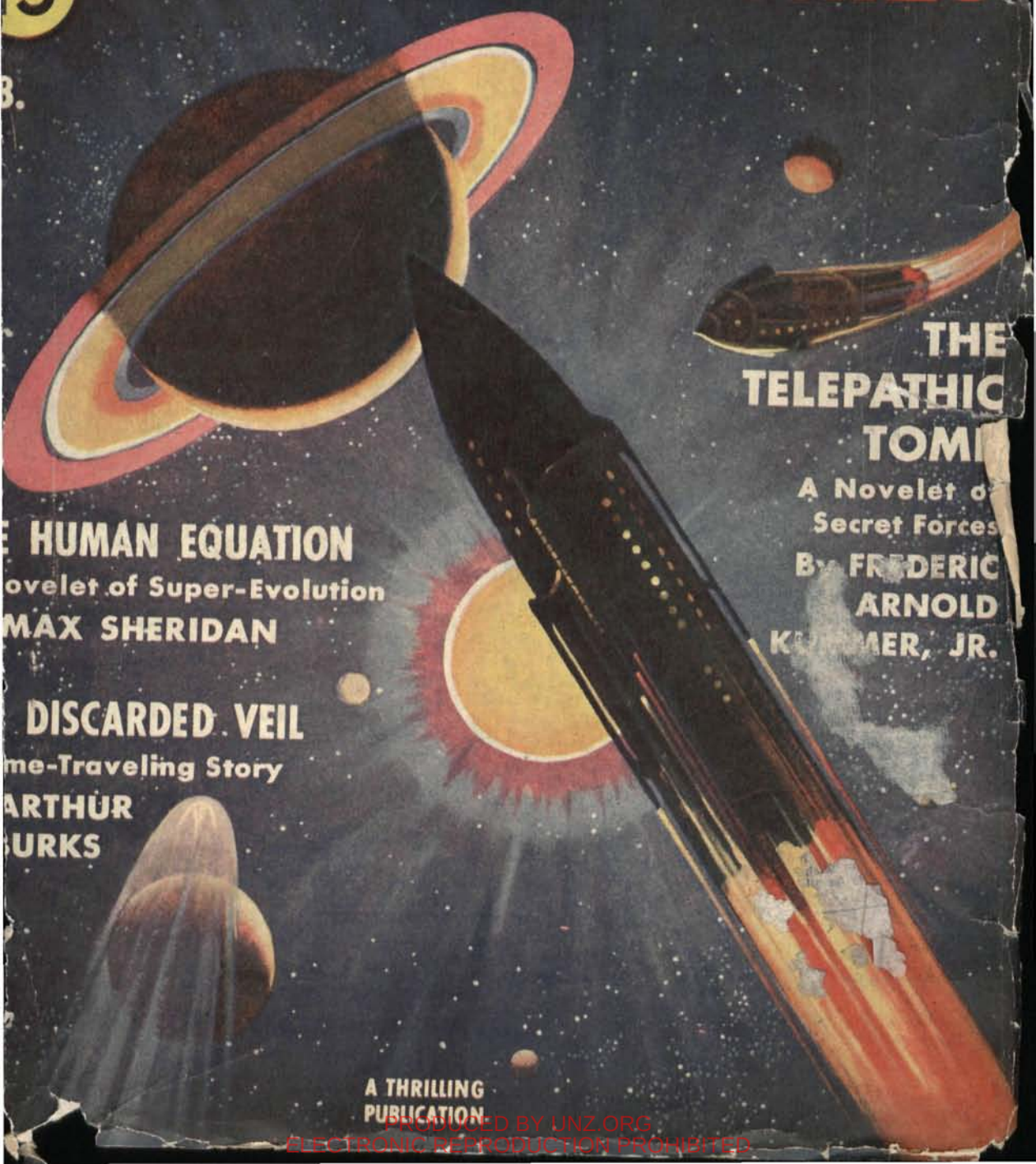
SPECIAL SCIENCE QUIZ IN THIS ISSUE!

THRILLING WONDER STORIES

15¢

B.



THE TELEPATHIC TOM
A Novelet o
Secret Forces
B FREDERIC
ARNOLD
K MER, JR.

E HUMAN EQUATION
ovelet of Super-Evolution
MAX SHERIDAN

DISCARDED VEIL
me-Traveling Story
ARTHUR
URKS

A THRILLING PUBLICATION

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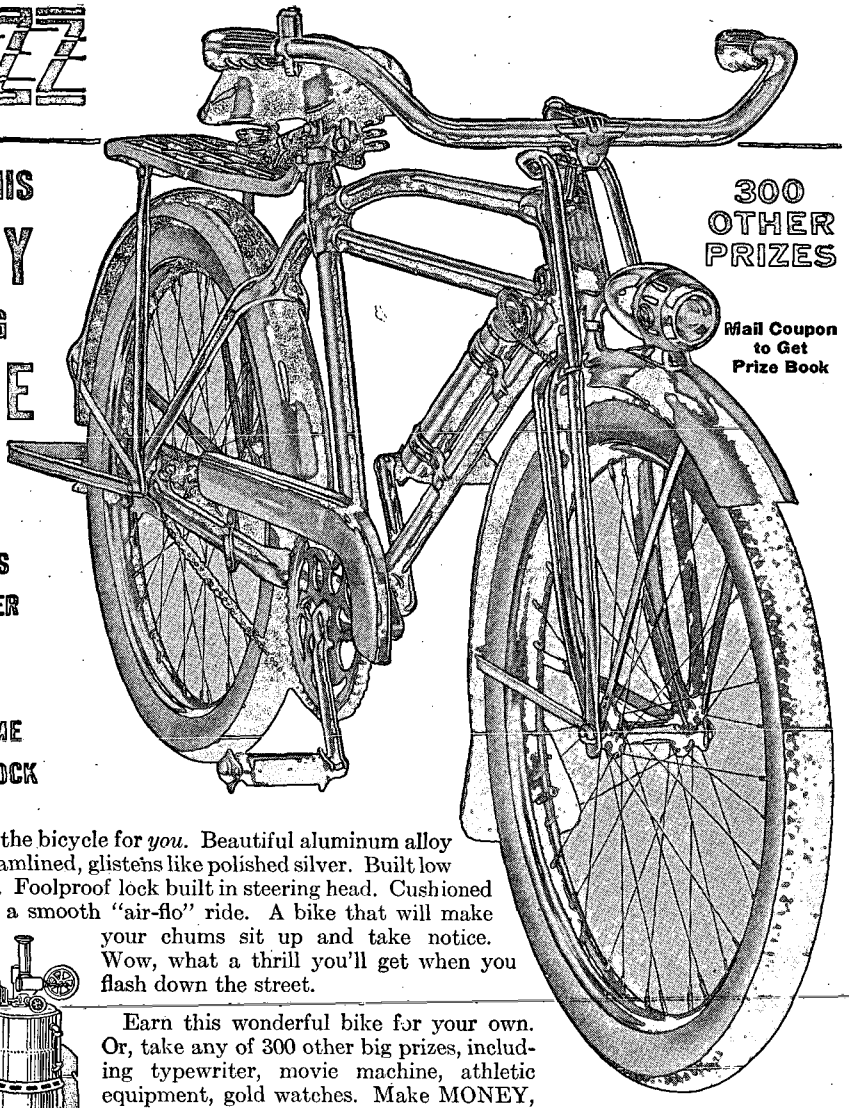
AHHZZ

BOYS, EARN THIS SPEEDY SILVER KING BICYCLE



300 OTHER PRIZES

Mail Coupon to Get Prize Book

Comes to you with

- BLAST HORNLITE
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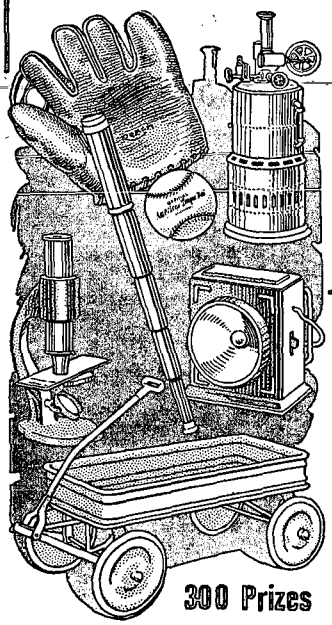
- COASTER BRAKE
- BALLOON TIRES
- DOUBLE-BAR FRAME
- STEERING-GEAR LOCK

OH, BOY! Here's the bicycle for *you*. Beautiful aluminum alloy frame, fully streamlined, glistens like polished silver. Built low for speed and safety. Foolproof lock built in steering head. Cushioned balloon tires, giving a smooth "air-flo" ride. A bike that will make your chums sit up and take notice. Wow, what a thrill you'll get when you flash down the street.



300 Prizes

Earn this wonderful bike for your own. Or, take any of 300 other big prizes, including typewriter, movie machine, athletic equipment, gold watches. Make MONEY, besides. It's easy. In your spare time just deliver our popular magazines to customers whom you obtain in your neighborhood. Some boys earn a prize such as a model airplane or compo-pearl knife the first day. Mail the coupon now to get started. State your age.

I WISH I HAD SOME SPENDING MONEY
HERE'S MY CHANCE! I'LL MAIL THE COUPON!
BRING A MAGAZINE EVERY MONTH
NOW I HAVE MONEY AND A BICYCLE, BESIDES!

MAIL THIS COUPON

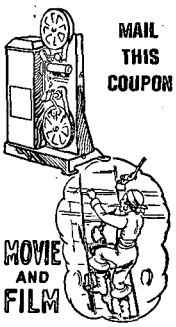
Mr. Jim Thayer, Dept. 853
The Crowell Publishing Co., Springfield, Ohio

Dear Jim: Send me a Prize Book and start me making MONEY and earning PRIZES.

Name..... Age.....

Address .....

City..... State.....



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MEN—Apply at Once!

If You Want a Remarkable Chance to

MAKE UP TO $45.00 IN A WEEK

Running Your Own Local Coffee Agency

Over 300 more men will be given the opportunity *at once* to run fine-paying Coffee Agencies right in their own home localities. A remarkable chance to make up to $45.00 in a week starting immediately. No experience needed. This company will send you everything you need, give you all the help you require, and back you up with its proven successful plans. A chance to be independent, work as you please, and make more than just a modest living.

Limited Number of New Openings

If you want to know whether there is an opening for you in your own or nearby locality, mail the Application below. By return mail you will be notified whether we have an opening for you, and if we have, you will receive full information about this Coffee Agency Plan. You don't send a penny—just mail the Application. No obligation—you decide after you read the plan. Don't delay. Send your Application at once.

Operate Right From Your Own Home

Everybody uses Coffee, Tea, Spices, Flavoring Extracts, and many other daily household necessities. They *must* buy these things. All you need do is visit your regular customers in your locality, supply their needs and pocket your fine profits. M. C. Ebert, Pa., reported $68.20 clear profit in a week; G. J. Olsen, N. Y., $79.85 in a week; W. J. Way, Kansas, with us 9 years, $19.10 in one day; Mrs. H. H. Hosick, Nebr., $41.73 her very first week; Mrs. Ella Ehrlicher, Mo., with us over 6 years, $85 in one week. J. W. Willoughy, Okla., $48 his first week. These exceptional earnings show *your* possibilities. Brand new Ford Tudor Sedans, or $500.00 cash if preferred, are given producers as a bonus in addition to their own cash earnings.

Find Out If Your Locality Is Open

SEND NO MONEY

Just clip out and mail the Application. It merely tells us that you would consider running a permanent, highly profitable Coffee Agency in your locality if we have an opening for you. We will write to let you know if we have an opening, and will give you complete details about this exceptionally fine opportunity. Then you can decide for yourself whether the money-making possibilities look good to you. Don't delay—rush the Application at once.

ALBERT MILLS, President
9241 Monmouth Avenue **Cincinnati, Ohio**

COFFEE AGENCY APPLICATION

WRITE YOUR FULL NAME AND ADDRESS HERE:

1

Name.....
(State whether Mr., Mrs., or Miss)

Address.....

City and State.....

2

HOW MUCH TIME CAN YOU DEVOTE TO COFFEE AGENCY?
Mark with an "X" ☐ FULL TIME ☐ PART TIME

Full time pays up to $30 to 45 in a week. Part time, either during the day or evenings, pays up to $22.50 in a week.

3

STATE WHICH BONUS YOU PREFER—CASH OR FORD AUTOMOBILE
In addition to their cash earnings, we offer producers a cash bonus of $500.00 or brand-new, latest model Ford Tudor Sedan. State which you prefer if you decide to accept our offer. Mark "X" before your choice.

☐ $500 CASH BONUS ☐ LATEST MODEL FORD TUDOR SEDAN

CAN YOU START AT ONCE? Mark with an "X" ☐ YES ☐ NO

4

If you cannot start at once, state about when you will be able to start.....

.....

RUSH! Tear Out and Mail at Once to
ALBERT MILLS, President, 9241 Monmouth Ave., Cincinnati, O.

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THRILLING WONDER STORIES

The Magazine of Prophetic Fiction

Vol. XIII, No. 1
February, 1939

IN THE NEXT ISSUE

THE JULES VERNE EXPRESS

A Novelet of Super-Velocity

By EANDO BINDER

MEN MUST DIE

A Novelet of the Spaceways

By WARD HAWKINS

WHITE BARRIER

A Novelet of the Next Ice-Age

By FRANK BELKNAP LONG, JR.

MADNESS FROM MARS

A Story of Alien Life

By CLIFFORD D. SIMAK

—plus many other unusual stories, novelets and features.

EVERY STORY BRAND-NEW

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ON THE COVER

The artist has depicted his conception of an interplanetary liner in transit from Saturn. Suggested by the novelet in this issue by Gordon A. Giles—FLIGHT OF THE STARSHELL.

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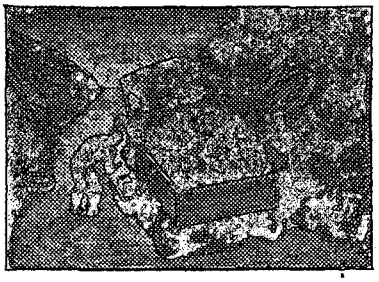
TRAPPED IN THE PATH OF BLIND DEATH!

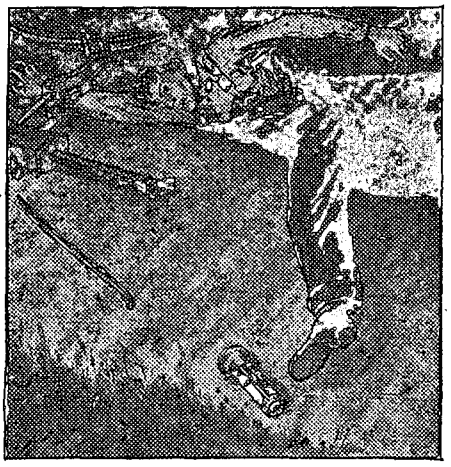
JALMER KRAPU

North Dakota Farmer Faces Doom, Pinned Beneath Disabled Truck

① "I was coming home from town one night with a load of coal on my farm truck," writes Jalmer Krapu, of La Moure, N. D., "when, a few feet from the top of a steep hill, a front wheel came off.

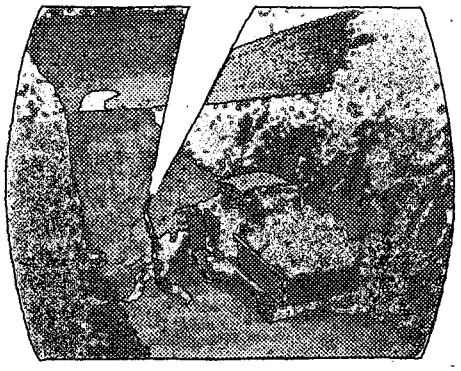


② "In the tool box, I found an old flashlight I hadn't used for months and was surprised to find it gave a strong light. I got out the jack and some other tools, then carefully put out the light to save the juice till I needed it more, and laid the flashlight on the road. My headlights ran on the magneto and so had gone out when I stopped.



③ "I had the jack almost to its full height when it slipped, the axle crashed down to the road again, pinning my arm beneath it. As I lay there helpless in the dark with my head against the road, I heard a car coming.

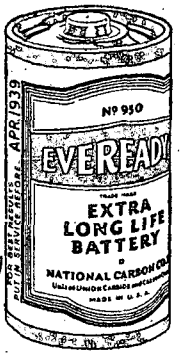
"In a few seconds he would be over the crest of the hill and roaring down on me. I *had* to warn him before he reached the hill top... or it would be too late! I was square in the middle of the road, *and death was on its way* ... certainly for me, perhaps for others, too.



④ "I thought of the flashlight lying there on the road... but I couldn't reach it! I stretched out toward it as far as I could, managed to touch it with the toe of one foot. I thought my arm under that axle would break as I strained for the light and finally kicked it to where I could reach it with my left hand, snap on the light and wave it above the crest of the hill to warn the approaching driver.

⑤ "Those *fresh* DATED 'Eveready' batteries rescued me from as desperate a trap as a man could be caught in. Thanks only to them I got off with only a lame arm when my number seemed to be up.

(Signed) Jalmer Krapu"



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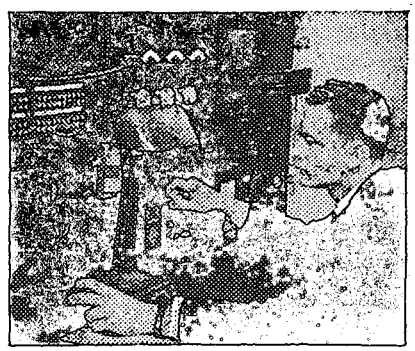

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"I was working in a garage when I enrolled with N. R. I. In a few months I made enough to pay for the course three or four times. I am now Radio service manager for the M——— Furniture Co., for their four stores."—JAMES E. BYAN, 1535 Slade St., Fall River, Mass.

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J. E. Smith, President, Dept. 9B09
National Radio Institute, Washington, D. C.

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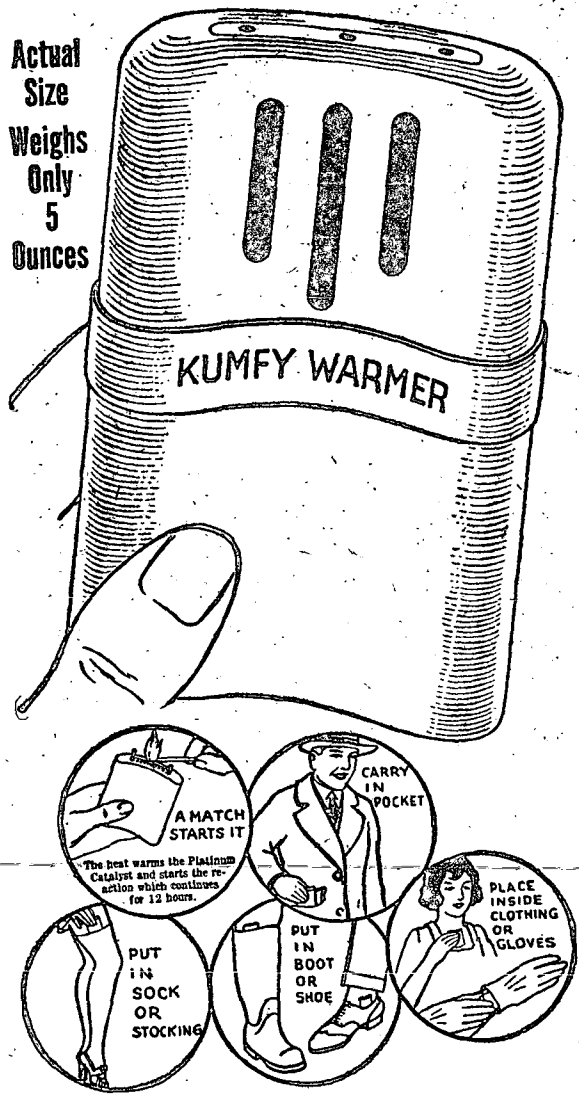
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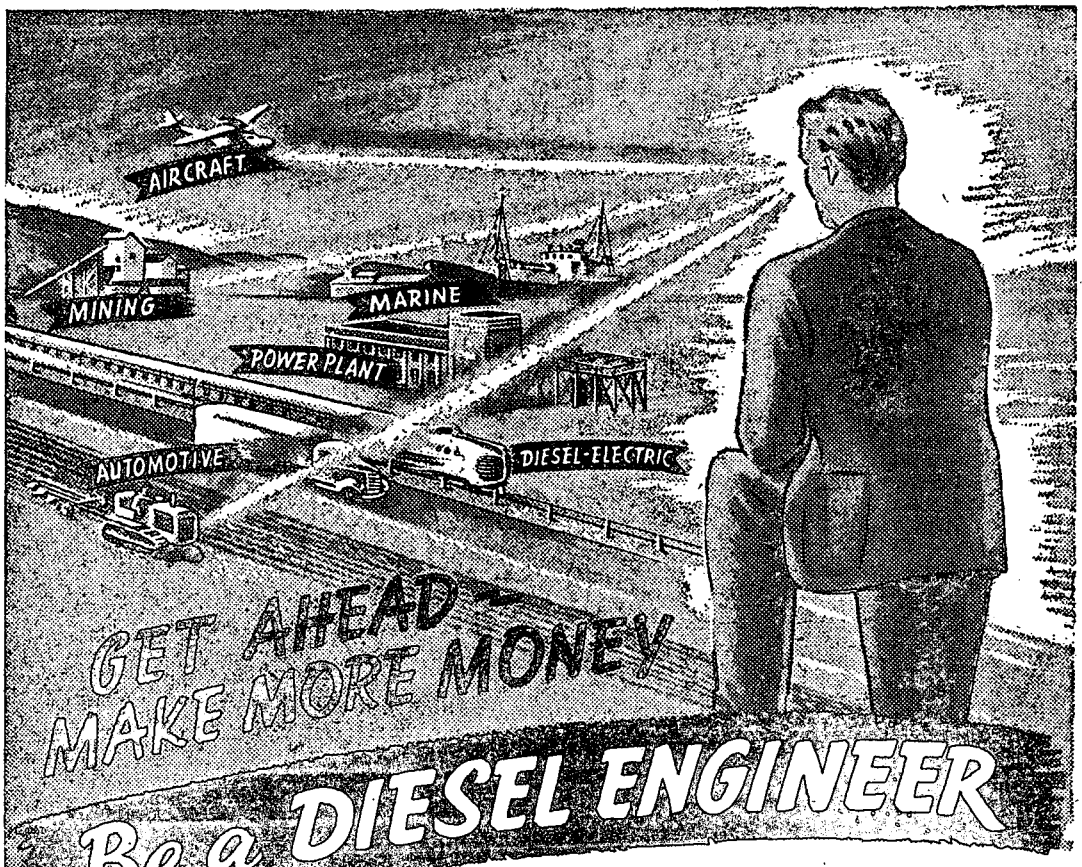

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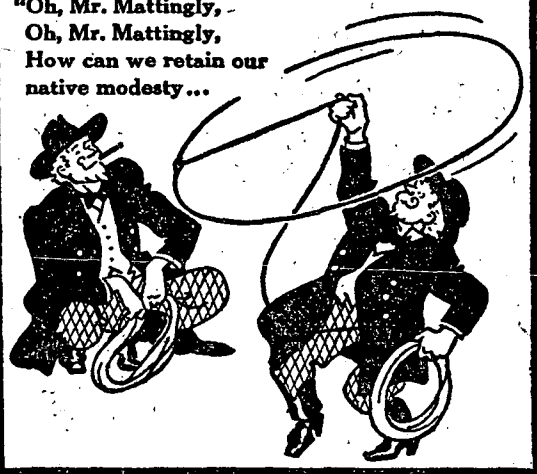

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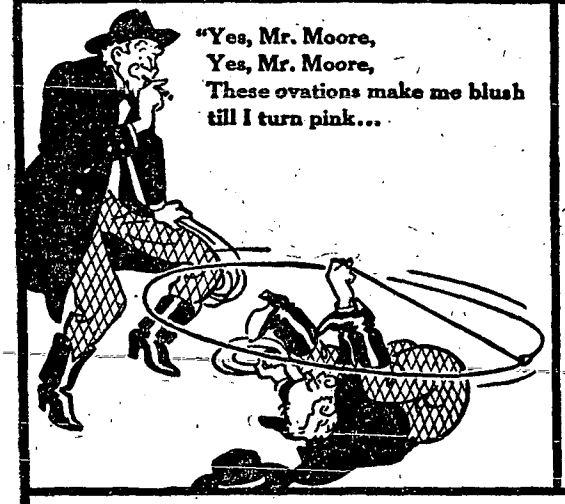

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Vol. XIII, No. 1 THRILLING WONDER STORIES February, 1939

Slowly, Inexorably, Man's Vital Element Seeps Away—and Science Braves an Unknown Realm to Find a New Life Formula!

They dodged aside as the black tentacles lashed out at them

THE HUMAN EQUATION

A Complete Novelet of Super-Evolution

By MAX C. SHERIDAN

Author of "Zones of Space," "Interference," etc.

CHAPTER I

Carbon Famine

CLARK FOLSOME and Jess Blake dodged aside as the sinuous black tentacle lashed out at them viciously. The arm-thick tendril lunged frantically in an effort to reach the escaping prey. Thick mucid slime oozed from its cup-shaped terminal disc—a malevolent drooling saliva—and a tiny drop of the viscous liquid, flicked by the lashing tentacle, fell on Folsome's upraised hand!

He wheeled. "Jess! The anti-solvent! Quick! I've got a drop of that

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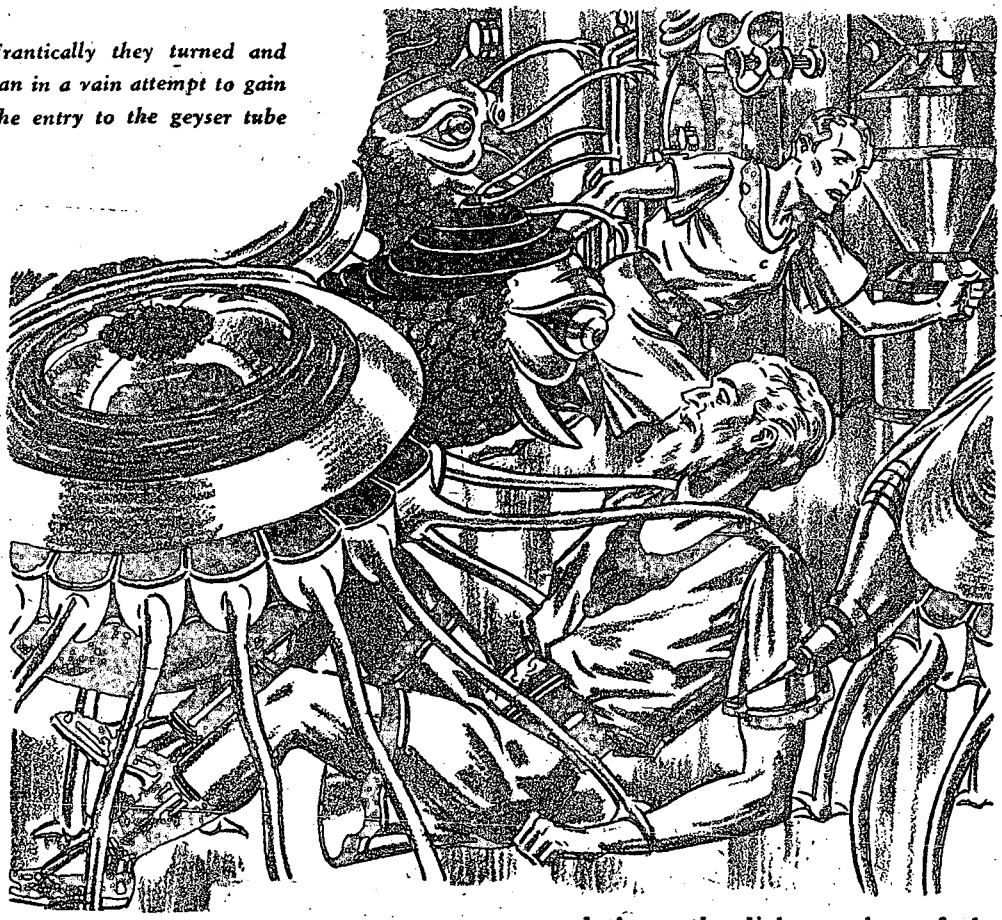

Frantically they turned and ran in a vain attempt to gain the entry to the geyser tube

aqua diabolo on my hand!"

Blake reacted at once, snatching a small bottle from a case at his belt and jerking out its stopper with his teeth. He upended it on the spot Folsome indicated. Folsome grimaced.

"Better be burned a little than poisoned a lot," the cadaverous Blake barked.

Folsome nodded, staring at the raw circular pit that had appeared on the back of his strong brown hand.

"Thanks, Jess."

"For nothing," Blake said gruffly, applying an adhesive compress to the wound. "This first aid doctoring is like the old custom of allowing a condemned murderer to order what he likes for his last meal. They hanged him anyway. Well, those damned devil-plants will soon have every atom of carbon left on Earth. Then what will it matter whether I saved your hand or not?"

Blake's melancholy brown eyes surveyed the outlandish member of the plant kingdom which had inspired their precipitous retreat.

Like a bloated and evil caricature of floral greed, the dead-white stalk of the plant reared its swollen bulbous length a dozen feet above the heads of the two men. Surmounting the bloated stem was a broad inverted saucer of a hideous mottled blue, and from the periphery of the cap a dozen sinuous tendrils emanated from as many scarlet depressions around its circumference.

Folsome grinned wryly. "While there's life there's hope," he said. That's what John Overman thinks, anyway. You haven't much faith in him, have you, Jess?"

"Don't like him," Blake said sourly. "Never did."

"Who does? But that doesn't detract from his scientific ability. That doesn't keep our fellow scientists, or us for that matter, from attending the conference he's called for today.

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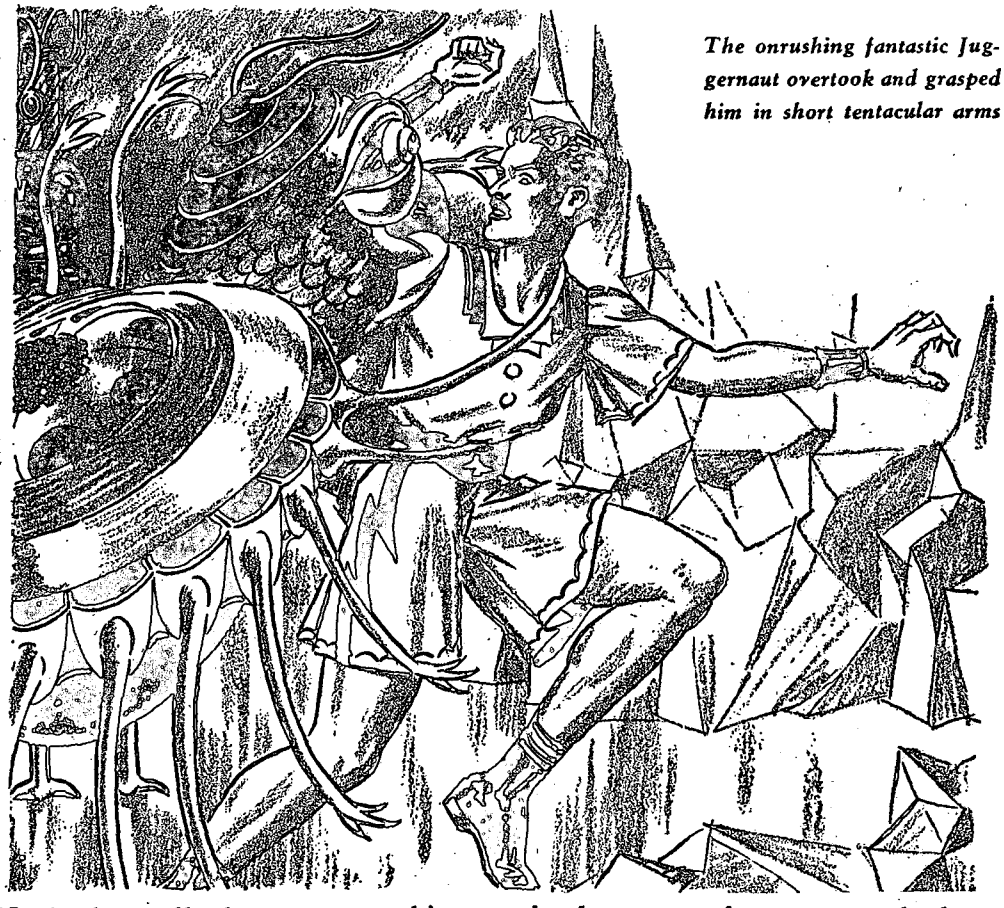

The onrushing fantastic Juggernaut overtook and grasped him in short tentacular arms

Maybe he really has got something, Jess."

"Humph!" the dour young scientist grunted. "To quote a phrase that's come down to us from a past age: I'm from Missouri, I've got to be shown."

"Then let's hurry. We're late as it is."

Jess Blake spat in the direction of the horrible plant. "I wouldn't expect to find you in the rottenest jungle," he said, addressing it. "And I find you in a city. In the words of the calamity howlers of a bygone age, what has the world come to?"

With a sigh, Folsome turned and led the way down the bleak and desolate boulder-strewn waste that once had been New York City's supreme pride and glory. That was what the world—their world, at any rate—had come to.

No longer was mighty Broadway a gleaming fairyland of elaborate establishments and bustling multitudes. No longer did architectural miracles tower above a smooth thoroughfare alive with darting automobiles and scurrying throngs.

A breeze sighed softly through crumbling masonry, sent eddies of brown dust scurrying ahead to settle slowly upon the rod-deep carpet of fine-grained sand. High piles of disintegrating concrete flanked the detritis-strewn aisle on either side—the crumbling remains of once-mighty buildings stood guard over the ghost of Broadway, their skeletons of steel all twisted and asymetric, the steel itself pitted with strange marks of erosion.

CLARK FOLSOME and Jess Blake picked their way cautiously, avoiding the occasional hummocks which studded the sand-strewn waste. There was reason for caution. Once a long sinuous arm shot out from behind a hummock with vicious greed, and fell short by only a few feet.

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With a shudder, Blake shot a glance over his shoulder at the thing which grew in the lee of the mound, his eyes bitter with loathing. The Devil-Plant seemed almost to crouch behind its ambush, its questing tentacle eagerly extended.

Like some loathsome ghoul from a hideous nightmare, it fed greedily on the decaying remains of a mighty civilization—it fed on carbon.

The two young scientists came in sight of their destination. Folsome pointed ahead to a broad low structure squatting in the midst of the desolate ruin. Its low walls and flat roof glinted in the noon-day sun with iridescent myriad-hued lights, like a fabulous jewel in a setting of filth and squalor.

"There she is, Jess—the sanctum of the International Scientific Association. Not as ornate or spacious as the Association's institutions of a hundred years ago, but a step forward none the less."

"A damn short step," Blake growled.

As the two men approached the broad structure, a door opened and a figure stepped out. Tall, spare, white-bearded, he looked what he was—a true savant. He greeted them heartily.

"Glad to see you, Folsome. How's everything, Blake—still taking your customary gloomy view of things?"

Folsome met the older man's firm grip warmly. "Glad to see *you*, Doctor Madrell!" Even Jess Blake's mournful countenance brightened perceptibly.

"Overman here yet?" Folsome asked.

Doctor Madrell nodded. "Come on in. We're just about ready to start. Overman has asked to present his discovery first, then the floor will be open for questions and argument."

Inside, the light from the midsummer sun filtered through the translucent walls and ceiling of the building, illumining the interior with a soft opalescent glow. The Association had constructed the station entirely of silicon dioxide—sand. Not an ounce of cement, lime, nor any carbonate nor material containing carbon had entered into its construction. The malignant Devil Plants, in their eternal search for carbon, could find nothing in the building's substance to batten on.

Now its small auditorium was packed with men of all ages and nationalities, and hummed with a buzz of conversation. There was a tense air of expectancy, but the two comrades, Folsome and Blake, were greeted with unconcealed pleasure—both were prime favorites.

Madrell led them to seats on rough sandstone benches. When they were seated, the room became suddenly silent as a man stepped from the Research Laboratory entry and ascended the low dais which occupied the front of the auditorium.

CHAPTER II

The Horns of the Dilemma

JOHN OVERMAN was of medium height and slight build. His narrow aquiline nose, firm thin lips, and high forehead portrayed the keen, sensitive mind which, in spite of an unattractive personality, had carried him to the highest levels of the Association.

His pale blue eyes with their almost transparent irises calmly surveyed his audience, and a smile tinged with disdain curved his thin lips.

"My skeptical friends," he began, "I have at last solved the problem that was foreseen and unsolved for a hundred years!"

His words rang and struck sparks like a hammer on an anvil—the ring of pride, the sparks of a fierce ego housed in a body of inferior stature.

"Be skeptical in your minds," he flashed. "That is your right as scientists. But do not scoff in your hearts. That is not your right as fellow humans. Humans have no right to be proud of their present status upon Earth.

"But a scant century ago, in the middle of the 20th century, Man was at his peak. His cities dotted the

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landscape. His buildings thrust their spires toward heaven. His roads crossed and crisscrossed the continents. His machines sped on the surface of the seven seas, nosed through the dim depths, sped through the upper air, produced his needs, lightened his labors, made him the seeming master of his fate. He was proud and he had a right to be.

"But his pride sustained a rude shock—the discovery that Earth's atmosphere was slowly losing its carbon dioxide!

"His scientists, amazed at the phenomenon, immediately looked for an unprecedented profusion of plant growth which could account for the loss. Did they find it? No, they found exactly the opposite! Vegetation was on the decrease instead of increase!

"They searched for a new evolutionary development of marine life which, increasing in numbers and hence in carbonate manufacture, could account for the using up of CO_2. The reverse was true. Animal life was decreasing, as well as plant life. Why not? The food supply was being reduced.

"Alarmed, the scientists saw that unless the leak in the Carbon Cycle were discovered and stopped, the atmosphere's carbon dioxide would soon be depleted to a point where the food-stuffs raised to support Man's teeming civilization would be insufficient. But they could do nothing.

"The condition became acute. Crop failures all over the world brought famines that mowed down Earth's population in the tens of millions. Desperate, the World governments purposely fired the remaining forest tracts and flooded limestone beds with huge quantities of commercial acids in an attempt to return a quantity of precious carbon dioxide to the atmosphere.

"It proved but a temporary alleviation. Man slowly began to realize that he was doomed.

"But there came a man, a scientist, by the name of Elias Covington, who, seventy years ago, discovered a method of synthesizing organic compounds from raw carbon.

"With Covington's process, it seemed once again that human intellect could encounter and conquer a major obstacle to its progress.

"BUT then it came—that enigmatical juggernaut of evil—the onslaught of the Devil Plants.

"Where they come from, how they evolved, no one then nor since has ever been able to discover—but, like a hideous horde of parasitic ghouls, they have spread and increased until no spot on the face of the Earth is free of their insidious depredations.

"What are they? They have the terrible faculty of dissolving the element carbon and transforming it directly into organic compounds. They multiply rapidly and have spread their progeny to the four corners of the Earth.

"From the time a microscopic Devil-Plant spore settles on carbon-containing material until it reaches its mature height of fifteen to twenty feet, only twenty-four hours elapse. At the time of maturity, usually shortly after noon each day, each Devil Plant bursts, releasing the major part of its pilfered carbon in a flood of carbon dioxide which scatters the countless billions of tiny spores over a vast area."

Overman paused for the first time, but the next instant his voice was crackling. "Once again there existed an enigma which baffled the best scientific minds of the world.

"That is the paradox, gentlemen! For, with millions upon countless millions of those plants releasing their flood of CO_2 day after day, one would think that the atmospheric content of the gas must surely increase. *But the most precise analyses show no increase whatever.*

"In some mysterious and utterly unaccountable way the enormous volume of gas disappears entirely after a few short hours.

"It is fifty years now that those malignant plants have been matting Earth's surface, seeking out every gram of carbon contained in the vestigial deposits of coal and oil overlooked by man, every grain of the ele-

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ment contained in the vast beds of sedimentary rocks, in building stone, in the structures man has erected.

"But man's structures have not been enough. Like harpies they crouch, waiting for man himself, for anything animal, to come within range of their prehensile tentacles.

"They have been all too successful. Where two billion humans once lived upon Earth, there now remain a scant hundred thousand. The rest have either perished of hunger or have succumbed to the direct onslaught of the Devil Plants. And we can look forward, unless something is done, to the ultimate perishing of the Race of Man!"

John Overman paused again and his pale blue eyes flamed.

"But something *can* be done!" he cried, "and something *will!* For I have found the answer to the challenge to Man's continued existence—I have found the defense, the only defense against this devilish enemy!"

John Overman lowered his voice, leaned forward. His audience waited tensely, held in thrall by the scientist's fanatical confidence.

"It's simple," Overman said, and he seemed almost to hiss the words. "If there is no longer enough Carbon in the world to support life, *why not use silicon?*"

The spell was suddenly broken. A dozen men sprang to their feet, all talking at once, denying, expostulating, attacking, ridiculing.

BUT again the disdainful smile twisted the corners of Overman's thin lips. He waved them down. "Listen," he said, and there were overtones of proud arrogance in the hissed word. "Silicon is the one element in the long list known to Man which comes closest in character to carbon. Each has three allatropic forms: amorphous, graphitoidal, and crystalline. Each shows similar tendencies to unite with identical elements in the same proportions. Each has an extremely high melting point. Outside the variations of physical appearance and atomic weight, the one main difference lies in the fact that Carbon easily unites again and again with itself and several other elements to form chain and ring or cyclic compounds. In this characteristic lies the ability of Carbon to form massive complex molecules which we call Organic Compounds.

"Now, attend to what I say! If Silicon could be forced to emulate Carbon in this respect, there would be no essential difference remaining between the two elements. *Gentlemen, I have done that!* I have forced Silicon to combine and recombine, both with itself and with atoms of Oxygen and other elements, forming chain and ring compounds as complex and varied as any organic compounds!

"So we come to the problem that has brought us here—the solution of mankind's difficulties, the defense against the enemy that threatens the existence of his race. Gentlemen, I put this proposition before you: if silicon may be made to replace carbon in all its phases of existence, *why not replace the carbon atoms in the human body with atoms of silicon?*"

The scientists no longer expostulated, they were silent.

"If that were done," Overman continued with a twisted smile, "the structure of the human body would remain essentially unchanged, except insofar as the silico-hydrates and Silico-proteins varied in some insignificant respects from the carbon compounds which they replaced in the various tissues."

But the scientists were recovering from their stupefaction, and Overman had to hold up a quieting hand.

"Think what such a transformation would do for the human race," he cried. "Mankind could expand without bound or limit. No longer would there be any necessity of limiting population, nor of spending precious hours, days and years in the unending search for food. For silicon comprises, with oxygen, an overwhelming percentage of the earth!"

He paused, but this time there was no response save silence, and he continued in a low, vibrant voice.

"I have discovered a way of catalyzing the reaction whereby the atoms of

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Carbon in the molecules of the human body may be entirely replaced by atoms of Silicon. I have designed and constructed a reaction chamber and the necessary equipment to bring about this metamorphosis.

"I propose that every human being left on Earth undergo this—*human equation!*"

He had won them! Their scientific minds had grasped his tremendously daring idea! They rose, and this time the dominant shouts were of approval.

But the minority was vocal. It made itself heard. It threatened to dissolve the meeting in pandemonium.

CLARK FOLSOME threw himself into the breach, realizing that these worried, hungry men might easily come to blows.

"Sit down, all of you," he cried. "Let's not sacrifice our dignity as human beings! After all, it's about all we have left. Let us consider Overman's proposal like the scientists we are, instead of harried humans whose hunger is perpetually alive.

"I for one don't doubt the possibility that *some* form of life might exist which had for an elemental basis some other substance than Carbon. However, during the millions of years which have elapsed since the first feeble life struggles of primitive, elemental life-stuff, there is not the slightest sign that any living thing has ever evolved with any element *other* than carbon as its basic substance.

"There must be a reason for that, and logic dictates what that reason is: Nature will not tolerate anything but the organic bases of life as we know it—the carbon base.

"Assuming that that base can be changed—to silicon as suggested by our distinguished colleague — would the game be worth the candle? It might be a defense against the Devil Plants—I believe it would be—but would it be a defense against Nature, the Nature that has told us what she wanted in a million year-long record —man—protoplasmic—organic—carbon-based. In short, should we risk destroying in a few short days, without further question, the laborious assays and tests that Nature conducted throughout the thousand millennia of the centuries? There must be some other way. I am for waiting and looking for it."

Folsome stopped, sought out Jess Blake's eyes and saw his friend clasp his hands and shake them over his head in approval. A spokesman for the Overman position strode to the platform.

"Folsome says 'Wait,'" he said. "I say there's no time to wait. The human race has been trying to discover the fate of the lost carbon for a hundred years! The ablest scientists of three generations have expended their entire efforts in the attempt to trace it, and have failed. We have reached our last stand. Overman offers a possible way out. If we do not grasp this chance, however slim, we are unquestionably doomed. At any rate it will do no harm to give it a trial. I'm for giving it a trial!"

"Vote!" rapped John Overman.

The vote was taken. It was two to one against the position taken by Clark Folsome.

Overman smiled crookedly. "I knew we were not cowards," he said. "I knew we were not crawling craven creatures unworthy of the name Man, cringing before a sacrifice made for the future of our race. Would not any one of us be glad to give his life, if he might by so doing perpetuate the race? Let us adjourn to the laboratory."

He turned and led the way.

CHAPTER III

Carbon Into Silicon

THE center of the research laboratory was occupied by a transparent cylinder whose base rested on a foot-thick mat of insulation. Except for the metallic chair which occupied its interior, and for the door set in pneumatic casements, the object might have been a giant tube in a modern broadcasting station.

However, its purpose was far stran-

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ger than the mere conversion and amplification of electro-magnetic impulses. For it was the reaction chamber in which the astounding chemical equation broached by John Overman was to take place—not between two inanimate chemical substances, but between *silicon* as one ingredient, and a *human being* as the other!

Overman paused before the cylinder and turned to the group of scientists who stood in a rough semi-circle, eyeing the strange apparatus with a mixture of expressions.

"The principle of the Reaction Chamber is simple," he said. "The cathode at the top, and the metal floor which is the anode, form the age-old familiar equipment for the electrolytic transference and depositing of matter. In a way all that the process amounts to is electro-plating, except that there is a complete replacement and exchange of component substances.

"The substance which catalyzes the reaction is none other than the insidious venom of the Devil Plants! A vaporous mixture of oxygen and finely divided particles of the carbon-solvent, *aqua diabolo,* is fed into the reaction chamber through the tube at the top, then a multi-phased high-frequency current is thrown on the electrodes of the cylinder.

"An atomic bombardment of silicon atoms from the cathode pelts the organic substance occupying the cylinder. The release of the carbon atoms from their complex molecules to make way for the silicon replacement is catalyzed by the presence of the *aqua diabolo,* which then enters into the equation by combining with the displaced carbon.

"Finally, when the reaction is complete, the occupant of the chamber is no longer composed of complex carbon molecules, but of silicon compounds in which the element silicon retains exactly the same relative positions as did its predecessor, carbon."

Overman paused dramatically, glanced from one to another of his audience. "We are ready!" he said.

A young scientist, imbued with Overman's passion, stepped forward.

"I am ready, sir," he said. "You are the only one who understands the operation of the equipment. You are needed to promote and continue your invaluable work. I will be the first to try the—Equation."

Overman scrutinized him keenly, hesitated for a moment, then said softly, "All right, Paul. Enter, please."

Overman opened the door at the base of the cylinder, and instructed the subject to remove his clothing. In a few moments the young scientist was seated naked within the confines of the reaction chamber. Overman shook hands with him, frowned slightly at the expression of venerative trust on the youngster's face, then closed the door and tightened the clamps, hermetically sealing the chamber.

He moved to the instrument board beside the reaction chamber, and adjusted the kilowatt indicator to an underscored reading. He opened the valves on tanks of oxygen and *aqua diabolo,* admitting the substances into a mixing and vaporizing chamber, from which they were admitted to the reaction chamber by the tube at the top of the cylinder.

Then, with a deft motion he closed the switch, throwing the current on the electrodes of the equation chamber.

INSIDE the weird transparent tube, the body of the young scientist jerked violently and continued to jerk. An almost visible stream of radiations poured from the cathode at the dome of the cylinder, streaming down upon his figure, which writhed and quivered in seeming agony at their impact. An eerie opalescent haze emanated from his body, surrounding and shielding it from the view of the onlookers. Slowly the haze increased in density, vast streamers of radiant energy flickered and danced in its nebulosity, weaving a corruscating cylinder of iridescent fire around the thing it enveloped.

For moments that seemed an eternity, Overman watched a dial whose pointer moved slowly from the lower to the higher end of its graduations. The scientists stood utterly breathless,

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watching the weird miracle within the tube.

At last the pointer reached its upper limits, and Overman threw open the switch.

Slowly the opaque nebulous mass thinned as the vapor within the cylinder was drawn off through the exhaust line, until finally the tense men caught a vague glimpse of the body within.

A sharp hiss of indrawn breaths rent the silence of the room.

Inside the great tube, the young scientist sat stiffly, rigidly erect in the gleaming metallic chair. The healthy tan of his strong young features had been replaced by an awful toneless gray that tortured the ability of human eyes to interpret its hideous shade. The white of his lean muscular body had given way to a darker variation of that terrible lifeless gray—and his eyes—

Hideous red irises set in eyeballs of a black so intense that it was a total absence of radiation or reflection, stared malignantly out at the men who surrounded the cylinder! The strong regular features were contorted in a horrible mask of malificence. The watching scientists gasped. What was this evil thing?

Overman finished closing the valves from the oxygen and *aqua diabolo* tanks, exhausted the impregnated gases from the cylinder, then unscrewed the clamps and opened the port at the base of the Equation Chamber.

Stiffly, awkwardly, the Silicon Man arose from the chair, took one hesitant step forward, then collapsed into Overman's arms.

Overman gently lowered the hideous figure to the floor, bent over it for a tense moment, then straightened up slowly.

"Gentlemen," he said. "He is gone."

A soft exhalation of breaths broke the silence that followed.

"Then—" one of the scientists at last ventured, "—the experiment is a failure?"

Overman shook his head vigorously. "Not at all. It simply means that the safe limit of power had to be established by experiment. It seems that there is a certain limit of reaction speed which the metabolism of a living organism can survive. Unfortunately that limit was exceeded in this, our first experiment."

His audience recoiled, disagreeably affected by the impersonal tone of Overman's voice.

Overman turned to the instrument panel, reset the output indicator at a lower figure, then turned back to the group.

"This time I am certain there will be no danger. The completion of the equation will require more time because of the lower potential, but it will not be fatal to a living organism. We are ready for another volunteer.

HOLSOME'S voice broke sharply. "Don't do it!" he said vehemently. He wheeled on the group of scientists. "Did you see what happened to Paul? Not just his death—his transformation! You saw the expression on his face, the evil light in his eyes. Certainly you who knew him couldn't mistake that change for anything other than an intrinsic and terrible alteration in the fundamental make-up of this very character!"

Most of the scientists nodded in agreement. But Overman, enraged by the reversal of his audience, wrathfully spat out a single sentence.

"Cowards!" he shouted. "Then I'll be the next!"

He turned to the instrument panel, closed the power switch and flicked open the valves—then leaped into the equation chamber and closed the door, fastening the interior clamps.

Slowly he sank down on the chair as he felt the cruel bruising impact of that mighty stream of silicon atoms from the overhead cathode.

In another moment the gaseous mixture of oxygen and *aqua diablo* was filtering into the chamber, absorbing the carbon atoms displaced by the silicon bombardment.

Once again the haze evolved into an opaque shroud which surrounded Overman's writhing form. Slowly the dancing opalescent flecks of light grew to a cylinder of stratified radiance, concealing Overman from the

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eyes of his aghast colleagues.

Folsome watched the equation indicator until it approached the upper limits of its dial, then as he had seen Overman do, he shut off the power and the gas mixture, and opened the exhaust valve to clear the vapor from the chamber.

Moments later, Overman's form again became visible to the tensely watching men.

His thin, almost ascetic features had turned to that hideous undefinable dead-gray. The whites of his eyes were that deep unfathomable black, framing the pale wan yellow of the irises like patches of inky space pierced by malignant alien rays of light.

The dead-gray features contorted in an expression so hideously malevolent that even Folsome flinched.

Overman struggled weakly to his feet, wavered unsteadily for a moment, then released the catches on the door of the Equation Chamber and stepped from its confines—*a living Silicon Man.*

For an instant his changed eyes gleamed with a strange alien glint as he faced his fellow scientists. Then, with visible effort, he forced the incredibly sardonic and evil expression from his face, and smiled at his stupefied audience.

"Well, it wasn't so bad after all."

His voice held a peculiar metallic quality that rasped the auditory nerves of the group. He seemed to radiate an ineffable wave of evil!

He spoke again, and Folsome winced at the discordant overtones in his voice.

"The way is now open. There is no longer any barrier between man and the supreme fulfillment of his every ambition, his every desire. We—we will lead the way in the conversion of man from a puny, dying carbon-creature to a new and radiant being of Silicon. Let us delay no longer!"

In spite of the disaster to one of their group, and of this hideous transformation of Overman, it seemed that once again he would sway the majority of the group to his side. A cheer broke from the younger members of the audience, and they swarmed forward to congratulate him.

BUT Folsome, sick at heart, turned and started from the room. He was joined by Dr. Madrell and Blake, who followed him silently out into the clean warmth of the midsummer day.

"Well," said Folsome slowly, "that's that."

"Yes," growled Blake. "That's Overman. He always impressed me as being as cold as stone—and now he is one."

Folsome straightened with an exclamation.

"That's it!" he ejaculated. "That's it!"

Dr. Madrell and Blake looked at him in astonishment.

"Sorry," he said shortly. "Just had an idea of what might have happened to our carbon."

"You take it calmly," gaped Blake. "I suppose you just remembered where you put it."

"Let's get going," Folsome snapped back. "I'll tell you on the way what my idea is."

The trio plodded back through the pitiful remnant of the once mighty city, picking its way cautiously among the mounds and hillocks of disintegrating masonry, avoiding by a wide margin the occasional bloated Devil-Plants.

At last Folsome came to a stop before a one story stone structure which had escaped the ravages of the Devil-Plants by reason of its silicon composition. He swung open the double iron doors which guarded the entrance, and led his companions inside.

The room was occupied by a bulking object covered with a tarpaulin. Folsome and his two companions carefully pulled aside the tarp, soaked in anti-solvent to forestall the Devil Plants, and disclosed a trim air-speedster with folded helicopter vanes.

"The only one left in the world as far as I know," Folsome said softly. "And there's probably the last hun-

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dred gallons of gasoline. I've kept it for use in an emergency, and that emergency has arisen. We're going somewhere."

The three men tenderly wheeled the trim ship out upon the sandy waste which had once been a broad avenue in the heart of the residential district. Moments later they had transferred every drop of the precious gasoline to the capacious tanks. They filled the battery, which had been stored dry-charged, then took their places in the small but comfortable cabin of the little ship.

After a few preliminary trials, the motor burst into full-throated song, and moments later the only plane remaining in the world left the ground and soared high above the crumbling remains of a mighty city.

CHAPTER IV

Descent Into Hell

FOLSOME turned the ship's nose to the West and slowly advanced throttle until the staunch little plane clove the air like a streamlined meteor.

"Well, what's on your mind, Clark?" Dr. Madrell gently reminded Folsome of his promised explanation.

"Just this," said Folsome slowly. "If the carbon and carbon dioxide are no longer on or above the surface of the Earth, then they must be beneath it!"

"So what?" Blake barked.

"So we're on our way to Yellowstone Park, with its countless thousands of openings into the bowels of the Earth," Folsome said calmly.

"I'll be jiggered," Blake breathed.

Hours later the trim little ship circled slowly over the once-beautiful, fascinating Yellowstone Park. Folsome brought the craft lower and lower over the desolate region near the former site of Old Faithful Camp. The three men scrutinized the scene below them in amazement, for nowhere was there any sign of active hot-springs or geysers.

As they circled lower and lower, it became apparent that even Old Faithful had been inactive for many years.

Suddenly the plane dropped with sickening speed, straight for the mouth of the extinct geyser. Folsome fought frantically, trying to pull the plane from that tremendous down-draft.

Down and down they hurtled until it seemed inevitable that they would crash directly over the yawning geyser tube.

At the last moment Folsome turned the ship's nose straight down, then suddenly levelled off and gunned the motor viciously. The little craft wavered hesitantly, then shot out of the vortex of descending air only a dozen feet above the ground.

They made a gentle landing. Folsome stepped from the ship, a hundred yards from the extinct geyser, and wiped the beads of moisture from his forehead.

"Whew!" he gasped. "Looked for a minute like Mephistopheles had given us a rush invitation."

His companions stepped from the plane. Blake grinned weakly, said nothing. Folsome stared toward the yawning bore of the geyser tube.

"Looks like there's a hole somewhere below, anyhow," he said. "Wonder where all that air's going?"

"We almost found out," growled Blake. "Now what?"

In answer, Folsome rummaged in the storage compartment of the ship and brought out a roll of cable and three flashlights.

Cautiously the three approached the rim of the geyser tube, marvelling at the tremendous draft of air descending into the opening. Folsome made the cable fast to a projecting horn of rock on a nearby boulder and lowered the other end down the geyser.

He raised and lowered the cable tentatively.

"Think it's reached a place where the tube levels off," he said. "I'll take a look and jerk the cable three times if everything's okay. Here goes."

He clambered over the rim, bracing himself against the downdraft of air,

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and started down the cable hand over hand.

Madrell and Blake leaned out over the opening, watching him tensely until the dark of the depths swallowed him, then waited restlessly for the signal. Moment after moment they watched the motionless line. Blake finally jumped to his feet and was ready to go down after his comrade when the cable moved with three distinct jerks.

HE heaved a sigh of relief, lowered himself over the rim, slid down the cable a few feet, then waited until he saw Dr. Madrell hanging on the line above him, outlined against the sky.

A little later the three friends stood together on the slope of a gentle incline where the geyser tube diverted its initial vertical descent to a more gradual one.

"What a wind-pipe Old Lady Nature has!" Folsome exclaimed, bracing himself against the draft of air which almost swept them headlong down the tube.

"Uhhuh," grunted Blake. "Nice if she'd sneeze about now."

Folsome flicked on his flashlight and turned the beam down the gently sloping tube. As far as they could see, the lime-incrusted, solution-colored channel extended down and down on a gradual incline.

"Here we go," said Folsome, starting out at a half-trot down the slope. Dr. Madrell followed close behind, and Blake brought up the rear, mumbling something about "a grave digger's Paradise."

Gradually the passage assumed a steeper pitch and before long they found it necessary to dig in their heels to keep from being swept down the incline by the descending draft of air.

Suddenly they came out into a spherical chamber where the boiling solutions of the geyser had eroded a room in the solid rock. A pool of stagnant liquid of a bilious green hue lay in a shallow depression at the side of the chamber.

The three friends choked and retched at the disgusting, nauseating odor which emanated from it. Folsome held a hand over his mouth and nose and stepped to the brim of the pool. His eyes opened wide, and he gestured to the others. Holding their breaths to exclude the foul odor, they stepped to the edge.

Half immersed in the shallow depth of green liquid they saw something they could not classify, scientifically trained though they were.

Disintegrated and corroded by the action of the liquid in the pool, what appeared to be the remains of a weird and fantastic creature lay in a shallow depth of bilious liquid.

"What in the name of Heaven is it?" Dr. Madrell exclaimed, leaning closer in an attempt to recognize even one familiar feature in the anatomy of the grotesque thing.

"You mean what *was* it!" grunted Blake, backing away from the sickening stench.

Half like a giant snail, half like a great, hideous centipede, yet strangely like neither, the half-decomposed thing in the pool sent icy spasms of fear surging through the minds of the three companions. It was not so much a physical fear as the abstruse haunting fear of the unknown.

Folsome shivered and turned away. He quickened his steps as he turned back into the descending passage which led from the strange chamber.

Dr. Madrell and Blake both heaved sighs of relief when they were clear of the room, and took deep breaths of the comparatively clean fresh air.

They continued downward. The sloping gullet seemed bottomless. It led again and again into chambers eaten out of solid rock, and sometimes into constrictions where the bore was so narrow they had to crawl through on their hands and knees.

Down and ever down the geyser tube extended, until they were miles below the surface of the Earth.

Suddenly Folsome, in the lead, stopped and held up a hand.

"Do you hear anything?" he asked.

THE three men held their breaths, straining to catch the slightest vibration in the silence that followed.

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Then they heard it. Dimly and faintly, a low throbbing pulsation through the columns of air in the narrow passage.

"Dame Nature seems to have the hiccups," suggested Blake.

"Maybe we're penetrating to the zone of volcanic activity that formerly activated the geyser," said Dr. Madrell.

Folsome shook his head. "No perceptible rise in temperature. Can't be much heat or we'd feel it immediately in this small passage."

He started forward again, the others following with ears straining to catch the slightest sound.

Gradually the throbbing grew more and more intense, until it beat like huge hammers of solid sound.

Finally, when they knew that any further increase in volume would be absolutely unbearable, a faint light showed in the jet of the bore just ahead.

In a moment they had emerged from the narrow confines of the tube, onto the floor of a cavern so vast it seemingly had no bounds.

A bluish green glow permeated the air, illumining the place like phosphorescent displays at sea, or perhaps more like the Aurora Borealis, for there seemed to be a stratification of the luminous haze, each band of soft-toned shade giving way gradually to a different hue.

"Talk about Hell's Half-Acre," mumbled Blake. "Here's a whole ranch—with a rainbow to boot!"

"Look!" Folsome shouted above the throbbing din of sound. He pointed to one side, beyond the entrance to the tube.

A mighty mass of machinery was dimly visible in the strange halflight of the huge cavern. Tremendous wheels revolved with a ponderous monotony. Eccentric gears, transferred the motion to yard-thick rods. Mighty cylinders gave forth a deep vibrant throb as the thrust was transferred to laboring pistons. Towering spiral coils loomed in the background, suspended above great gleaming metal vats. And beyond the vats lay acres upon acres of strange incomprehensible mechanisms.

For long moments the three men stood, utterly dazed at the unbelievable sight. Suddenly Dr. Madrell uttered a startled scream of warning.

Folsome and Blake wheeled about.

Darting toward them with astounding speed were three incredible Things!

"God in Heaven!" Folsom breathed. "They're the—Thing in the Pool!"

Frantically the three men turned and ran in a vain attempt to gain the entry to the geyser tube. The attempt was worse than futile. In another instant the onrushing fantastic juggernauts had overtaken and grasped them in short tentacular arms.

The grip squeezed the breath out of them. They lost consciousness.

When Folsome awoke and painfully struggled to a sitting position, Dr. Madrell and Blake were bending over him, relief in their eyes now that he had regained consciousness.

"All right, old man?" asked Blake anxiously, helping him to his feet.

Folsome nodded, wincing with the pain of his bruised muscles.

"Just where are we?" he asked wonderingly, turning to examine his surroundings.

ON all sides were masses of strange incomprehensible apparatus. At one side of the room, tier after tier of metal canisters were stacked in neat rows. Dozens of great stone crocks occupied a corner of the room. It looked like an abandoned or unused laboratory.

"Evidently the Things are highly intelligent," he said. "What do you suppose they are going to do with us?"

"You tell me what they are, and I'll tell you what they're going to do," growled Blake.

"I have a good idea what they are," said Folsome.

"All right, Professor. Tell us."

"They're Silicon Creatures."

"What?"

"Silicon Creatures. Things whose structural substance has silicon instead of carbon as a basis. Just like Overman—now."

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"How do you know?"

"Common sense. There's no sun down here to enable plants to convert carbon dioxide into edible matter. Besides, they feel and look like things made out of a strange, unnatural compounds."

Blake and Dr. Madrell nodded in agreement, remembering their capture, and the nauseating sensations brought by contact with the Things.

A sharp click and a rasping sound from the corner of the room brought the three men to startled attention. They searched apprehensively for the source, wondering if the Silicon Creatures were returning. Then they saw the diaphragm mounted on the wall of the laboratory.

A metallic voice grated harshly through the room.

CHAPTER V

The Fiery Etchers

"I SUPPOSE you are wondering what has happened to your lost carbon. I suppose you are also wondering how I am able to speak your language.

"As for knowing your language, you three are far from being the first human beings in the world of the Slaggens. In years past we have captured and held for study and dissection, a great many of your race. You see, we have been endeavoring to find the reason for the essential difference existing between organic compounds with carbon as a basis, and those same compounds with silicon as a basis.

"Why? Because, as you evidently realize, we are beings of Silicon rather than carbon. However, we were not always so composed—and therein lies the reason for the disappearance of your carbon.

"According to our legends, a millenia of centuries ago our forefathers were composed of complex carbon compounds, even as you humans. For untold eons they had inhabited a planet of Thea, one of your nearer stars, evolving an increasingly more mighty and intelligent race.

"Then came the day when an increased rate of atomic disintegration began the transition of their sun into a *nova*.

"Realizing their danger in time, they constructed space ships and fled to your planet Earth, taking refuge in this great bubble beneath its crust—because its glacier-clad exterior was hostile to life.

"Faced with starvation after the available carbon was exhausted, the scientists developed a method of substituting silicon for carbon in the bodies of the Slaggens."

Folsome, Blake and Madrell stared at each other in amazement. Overman's discovery made an eon ago! Applied, even as Overman had applied it.

The metallic voice continued, "It seemed that now all their troubles were over, for silicon is Earth's most abundant solid. However, after untold centuries of time, one thing became increasingly apparent. Our race was not changing nor evolving toward a higher life!

"Unlike Carbon Creatures, our complex silicon pseudo-organic compounds are not subject to small variations and changes which produce what you call mutations. Mutations, of course, are the inheritable fluctuations in the mental and physical structure of a species, and are the one and only means by which an organism can attain a higher plane of existence.

"Realizing that as Silicon Creatures, our race was doomed to eternal stagnation, we determined to transmute ourselves back into carbon beings.

"In order to secure the essential carbon, we sealed off the channel of the geyser tube and excavated an extension to communicate with our cavern. We constructed the apparatus—which you saw—to extract the carbon dioxide from the atmosphere and convert it into a liquid carbon-oxygen compound.

"In a short time, however, we had exhausted the CO_2 content of Earth's surface atmosphere and still had only a small fraction of the carbon we needed.

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"Then our scientists, after years of endless experimentation, finally evolved what you humans call the Devil-Plants. Then, instead of the almost impossible task of ascending to the surface of the Earth, conquering its people and laboriously extracting the carbon from the limestone and coal, we merely released the spores of the Devil-Plants and waited for them to do the rest.

"At last, after years of effort, we are ready. Tomorrrow will see the first of the Slaggens transformed once more into normal carbon beings. After a million years of stagnation, once again our race will begin an ascending evolution toward the ultimate.

"You will be held until we determine whether the transformation will be successful. If anything untoward occurs in the process, we may be able to determine our error through a careful analysis of the molecular formation of *your* body tissues.

"Until tomorrow."

A SHARP click sounded from the diaphragm, indicating the connection had been severed.

"Until tomorrow!" muttered Blake. "We've got to find some way out of here!"

"We've got to find some way to release the carbon dioxide before these Things use it for their transformation!" Folsome said tensely.

"How?" inquired Doctor Madrell.

"As soon as we stepped outside, we'd be run down by a dozen Slaggens. And as far as I know, there's nothing that would harm the brutes. Their silicon-oxygen compounds are so damn stabled that nothing outside of melting them down would even muss their hair—if they have any."

"Wait a minute!" exclaimed Folsome in a low voice. "What about the Thing in the Pool? There *is* something that would muss their hair—and then some! Remember what glaziers used to use to etch glass? And glass is mainly silicon dioxide."

"Hydro-fluoric acid!" exclaimed Dr. Madrell. "But where—"

"Here! If this is a scientific laboratory, it's bound to have some!"

Folsome started toward the tiers of canisters at the end of the room.

Within an hour the three had located a dozen tins of sodium floride and a huge crock of sulfuric acid.

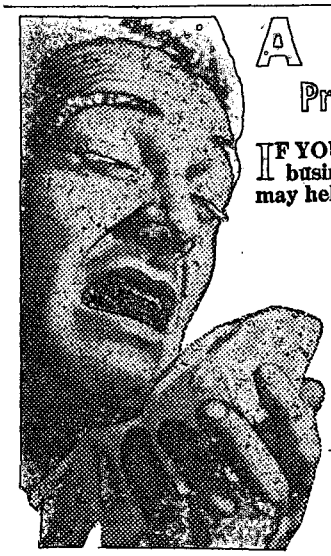
"What's to prevent our being well-etched, along with the Slaggens?" demanded Blake. "Fluorine is devilish stuff to work with."

Folsome pointed to several huge cakes of a white substance.

"Paraffine," he said. "We'll have to coat ourselves with it, pour the acid on the fluoride, hold our breaths and make a dash for the geyser tube."

A half hour later the three men had

[*Turn Page*]



A HEALTH WARNING!

Printed in the interest of public well-being!

IF YOU'RE nursing a cold—*see a doctor!* Curing a cold is the doctor's business. But there are certain precautions which, if taken in time, may help you to ward off a cold.

For instance, your own doctor will tell you that when your body resistance is high, you are not apt to "take cold so easily." And he'll also tell you that "keeping regular" is a great aid in maintaining a higher resistance.

So, keep your bowels open! And when a laxative is needed, use Ex-Lax! Ex-Lax is mild and gentle, yet thoroughly effective. And Ex-Lax is a real pleasure to take—it tastes like delicious chocolate.

For more than 30 years, Ex-Lax has been America's favorite family laxative. It's as good for children as it is for grown-ups. At all druggists in 10¢ and 25¢ sizes. Get a box of Ex-Lax today!

When Nature forgets—remember

EX-LAX

THE ORIGINAL CHOCOLATED LAXATIVE

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finished coating each other with a thin layer of warm plastic wax. They opened the dozen tins of fluoride, uncapped the crock of acid and carried it to the door of the laboratory. Folsome returned to the stack of reagents and came back carrying a small bottle.

"All set?" he asked tensely. The others nodded.

"Then let's go!"

With the words, the three men snatched up can after can of the fluoride, emptying it out in the narrow corridor between the endless row of huge vats which flanked the laboratory building. Hurriedly they maneuvered the acid crock to the opening, then Folsome motioned the others out.

As soon as they were in the clear, he stepped out the door, turned, upset the acid vat, flooding the fluoride, then scurried frantically up the corridor after Blake and Madrell.

As he came abreast of the huge metal tanks, he snatched the bottle from his pocket, uncorked it, and tossed it into the great vat of liquid carbon-oxygen compound.

He glanced back, saw two Slaggens come racing down the corridor toward him. As they reached the fuming pile of fluoride, they slowed down, staggered, then fell twisting and writhing in pain.

Frantically the three men raced for the geyser tube, trying to gain its refuge before the hydrogen fluoride was dissipated and other Slaggens took up the chase.

They emerged from the corridor formed by the rows of vats, and Folsome, glancing back, saw a dozen of the silicon creatures converging upon them from every direction. He urged his companions to greater effort.

At last they saw the yawning entrance directly before them. But almost at their heels were a dozen Slaggens. The three men raced into the opening, breath tearing painfully at their throats.

BEFORE they had traversed the bore a hundred feet, a dull crashing roar sounded from behind them and a violent blast of air sent them sprawling. But in a moment they were up again, continuing their mad race up the sloping tube. Gradually and perforce, they slowed their pace. Finally Folsome stopped, panting for breath, and motioned his companions to rest.

"What in the name of all that's holy caused that explosion?" Blake gasped.

Folsome grinned. "Phosphorus. Knew there'd be some uncombined oxygen in those tanks of carbon-oxygen compound. I threw a stick of phosphorus into one of the tanks, then prayed we'd reach the geyser tube before it ignited. We did."

Hours later, Folsome carefully set the little air-speedster down beside the gleaming sanctuary of the Research Station. The three men jumped from the plane and raced into the building, hoping against hope that Overman had been unable to persuade any of his fellows to follow his horrible example.

Their relief was tremendous when they found the group of scientists in the auditorium talking the situation over. They found that, because of Overman's queer and incomprehensible actions after their departure, the others had refused to submit to the transition. In an insane rage at their refusal, Overman had raced from the building and had not been seen since.

For the next few days the men carefully checked the increase of the atmosphere's carbon dioxide content—resulting from its release by the cumulative combustion of the compound in the cavern of the Slaggens.

Before long the percentage had increased from nothing to an oversupply. Realizing that a greater carbon dioxide content would be dangerous to human life, it was decided to stop the flow of gas from the geyser.

Armed with a dozen sub-atomic bombs, Folsome, Blake and Dr. Madrell once more took off in the air speedster for Yellowstone Park.

As they approached the site of Old Faithful, a roaring blast of sound could be heard plainly above the throbbing of the plane's motor. Then they saw the mighty column of gas and steam which shot from the geyser

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tube, ascending a thousand feet into the air. Old Faithful was active once more!

Even as they watched, the column slowly died down until only a low whisper of gas was escaping from the geyser.

"Must have burned itself out," said Folsome, as he set the plane down behind a high rock ridge, several hundred feet from the tube.

Carefully the three men placed the dozen atomic bombs in a circle around the circumference of the geyser, set the timing device, and took refuge behind the sheltering ridge of rock a hundred yards away.

Folsome looked at his watch, calculating the time to elapse before the blast that would seal the geyser, then peered around the corner of the sheltering ridge.

What he saw brought him to his feet in wild excitement. He waved his hands, beckoned frantically, screamed at the top of his voice.

JOHN OVERMAN, the Silicon Man, paused for a moment at the edge of the geyser tube. His jet black eyes with their hideous yellow irises gleamed with a malevolence beyond comprehension as he cast a single glance at Folsome, then turned and disappeared over the rim.

Folsome started to run for the geyser, but he was brought down by a flying tackle from Blake.

A moment later a terrific explosion rolled them over and over on the ground. Pieces of flying earth and debris rained down around them. Jagged splinters of rock slashed their faces and hands.

When the two had regained their feet, staring at the vast crater which yawned before them, Blake turned to Folsome.

"You take the cake," he growled. "If you wanted to commit suicide, you've had plenty of chances the last week, without waiting till now. What in the devil made Overman do that?"

Folsome shook his head slowly. "Thanks, Jess," he said. "I guess I still looked upon Overman as a human, and my impulse was to save him. But it's better this way. He was no longer human. How he got here is a mystery. Perhaps I was wrong about my possessing the only plane. If so, we'll probably find the one he used not far from here.

"Why he came we can only guess. What occurred to me must have occurred to him too, and he came to reverse the equation, to get back the carbon he had bargained away for silicon. Like the silicon creatures, he was dissatisfied with his silicon state and longed to be restored to the organic, the protoplasmic, the condition blessed and sanctified by Nature through the millenia—the Nature he had defied in his scientific arrogance and which now cursed him. For, unlike the silicon creatures, the bargain was of his own making.

"Perhaps he retained a vestige of his humanity, so that he was able to understand what he was from a human point of view and be repelled by it. Perhaps he saw that organic silicon compounds are in some obscure way vitally different from the carbon compounds they replaced in his body. They affected not only his general body metabolism but altered the trend of his mental activity, warping it into paths so utterly alien to the human soul that he recoiled from them in unimaginable anguish. . . ."

"LET'S get back to New York," Blake growled. "We've got a world to rebuild."

"Yes," said Doctor Madrell. "Thanks to Clark Folsome there will be people left to rebuild it. They will make it a better one, I think, than the one formerly known."

The tiny plane swiftly winged its way eastward over the now sealed tomb of the weird Silicon Troglodytes, which had also become the grave of John Overman, the Silicon Man.

The human equation was balanced.

NEXT ISSUE: THE JULES VERNE EXPRESS—AROUND THE SOLAR SYSTEM IN TEN DAYS! A NOVELET BY EANDO BINDER

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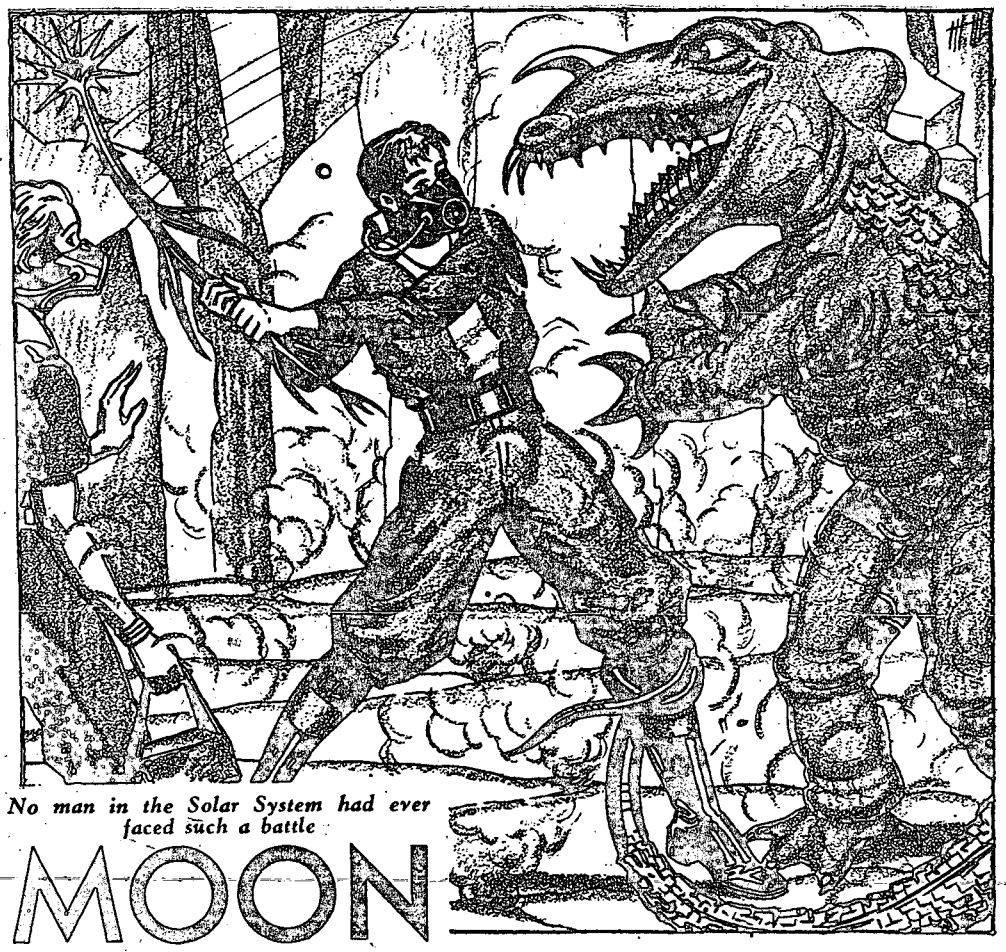
Adventurers From Earth Combat the Strange Biological Menace Embodied in the Blue Vapors of Titan!



No man in the Solar System had ever faced such a battle

MOON of MAD ATAVISM

By HAL K. WELLS

Author of "Man Jewels for Xothar," "Spawn of the Slime," etc.

THE lighted windows of the small sprawling building that housed the Isaac Morton research party glowed warmly yellow through the shimmering blue twilight that shrouded the eerily alien world of Titan.

The countless fumaroles and vents that pockmarked Titan's crystalline grey soil were near the peak of one of their regular eleven-day cycles of greatest activity, counting time by Earth chronometers. Blue vapor poured from the myriad openings in billowing clouds that nearly blotted from sight the mighty ringed bulk of

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Saturn high in the sky overhead.

In the blue miasma which seeped from hidden caverns deep in Titan's unknown heart there lurked a menace more starkly horrible even than Jupiter's purple death or the dread crumbling fever of the Venus swamp country. Men who breathed the insidious poison of that blue vapor died —but first they retraced the hideous Trail of the Beast. Death, when it finally came, was a thing of overwhelming relief, both to the victim himself and to those who watched the horror of his dying moments.

Inside the insulated walls of the building two men were bending low over a laboratory table, studying specimens of Titan's weird organic life. Isaac Morton, the titular head of the party, was a plump little figure of a man, with a heavy mop of snow-white hair and round cheeks that were as vividly red as one of Earth's apples. Blair Kent, his assistant, was, at twenty-eight, one of the cleverest research workers on the field staff of the Triplanetary Science Foundation.

His ruggedly clean-cut face was burned brown by the storm and sun of pioneer work on every habitable planet and moon in the Solar System. His tall lean body had been toughened and hardened until it was a lithe thing of steel wire and whipcord.

For several minutes the two men worked in a silence that was broken only by the muffled throbbing of the power plant that supplied the current for the building's protective screen against the monstrous menace of the blue vapors that swirled outside the walls. Beside them on the table were half-emptied flagons of *vardog*, brought to them several minutes ago by Morton's daughter, Ruth.

Blair Kent drained the last of the pungent Saturnian wine.

"Where's Laor Zak?" he asked abruptly.

Morton looked up in surprise.

"Back in his own quarters, I suppose. Why?"

"I'm worried about that greasy-skinned Martian," Kent said bluntly. "We're going to have trouble with him, and soon."

"Nonsense!" Morton exclaimed deprecatingly. "We had a little scene with him over that coronite deposit this morning, I'll admit, but he backed down quickly enough."

"Yes, and while he backed down," Kent said, "his eyes were pure red fire and his hair was crawling like a nest of snakes on his ugly skull. That coronite deposit, at the price the stuff is bringing right now, is enough to tempt a stronger character than Laor Zak. We're honor bound to turn it in to the Council, of course. But if we forgot our pledge and kept the coronite for ourselves we'd all be independently wealthy for life."

KENT placed an arm on Morton's shoulder.

"That isn't what's really worrying me about Laor Zak, though," he said tautly. "It's his actions toward Ruth."

"Laor Zak bothering Ruth?" There was incredulous anger in Morton's voice. "He wouldn't dare!"

"He already has dared," Kent said bitterly. "He's been making a nuisance of himself for weeks. The only reason Ruth hasn't complained about it long ago is that she happens to be about the pluckiest sportswoman in the System. With the four of us cooped up together here until the Council rocket returns to pick us up she knew that if she reported Laor Zak's actions to us there'd be a blow-up that would make life miserable for all of us. But it's a full Earth week yet before the rocket is due, and Laor Zak is getting so thoroughly unple—"

Kent stopped squarely in the middle of a word as from somewhere in the next room a woman's scream cut sharply through the throbbing of the power plant. Kent's face whitened. He hurled himself toward the laboratory door, with Morton padding along at his heels. They flung the door open into the main living room of the building, and found themselves facing a tense tableau of stark menace.

In a far corner of the room Ruth Morton was backed against the wall, trying futilely with all the strength in her trim slender body to ward off the embrace of Laor Zak, the Martian.

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Their two struggling figures made a vividly contrasting pair.

At twenty-three, Ruth Morton was a striking vision of blond loveliness. Years spent on the sun-drenched plains of Mercury and Venus had tanned the smooth skin of her oval face and softly rounded arms to a creamy golden tint that was only a shade lighter than the clear amber of her bobbed hair.

Laor Zak was as dark as the Earth-girl was blond. His angular, barrel-chested figure towered even taller than that of Blair Kent. Like most Martians of the canal cities, Laor Zak could have passed at a little distance for an unusually tall Earthman. But when seen at close range the physical peculiarities of his race were strikingly evident.

The skin of his hawk-featured face and six-fingered hands was curiously oily in texture, with a marked greenish tinge in its swarthy pigmentation. During moments of emotional stress, chatoyant fire glowed vividly in the red pupils of his deep-set eyes, and the oddly motile hair that is the distinguishing mark of all Martians writhed like a mat of fine black snakes over the bones of his high-domed skull.

Chatoyancy was flickering redly in Laor Zak's eyes now as he fought savagely to sweep the struggling girl into the embrace of his powerful arms. Ruth Morton's face was a contorted mask of terror and loathing.

Laor Zak was too intently engaged to notice the arrival of Blair Kent and Isaac Morton. Kent shot across the floor with the silent savage rush of a charging tiger. His hand closed like a vise over Laor Zak's shoulder, tearing the Martian away from Ruth. Kent's right fist lashed solidly home on the point of the green-skinned jaw.

The impact of the blow sent Laor Zak crashing headlong to the floor. The Martian came to his feet again with the loose-limbed grace of a giant cat. He shook his head for a moment to clear the dazed film from his glowing red eyes, then with a sibilant snarl of stark fury he came charging in.

Kent's eyes narrowed in surprise. The sight of a Martian having the cold nerve to engage in hand-to-hand combat was a decided novelty. Physical courage was a quality that was rare among the treacherous, cruel races of Mars.

BUT the fact that Laor Zak was willing to fight was as welcome as it was unexpected. Kent's lips set in a tight smile of grim satisfaction as he stepped forward to meet the Martian's rush.

Laor Zak attacked in the immemorial manner of his race, his long powerful arms outspread to seize his antagonist and sweep him close in a constricting embrace of spine-breaking power. It was an odd fact that of all the races in the Solar System only Earthmen and the tiny little blue dwarfs of Callisto had ever learned the value of fists as offensive weapons.

Kent waited until the last fraction of a second before he sidestepped Laor Zak's rush. One of the six-fingered hands missed Kent's face by scant inches. Then he was past the Martian's guard. His left fist jabbed with piston force high on Laor Zak's cheek. The Martian lurched, temporarily off balance. Kent sent a right cross smashing solidly against the side of Laor Zak's jaw.

The Martian's knees sagged. Again his red-glowing eyes filmed. Kent stepped in close. His jabbing left to the nose sent the Martian's ugly head rocking back. Kent's right flashed up in a jolting uppercut that blasted Laor Zak solidly off his feet.

Kent staggered and nearly followed the Martian to the floor. That last savage flurry of blows had brought a strange and alarming reaction. Fatigue was closing like a leaden blanket over Kent's muscles. The change had come with startling suddenness. Sixty seconds ago his body had glowed with the vigor of perfect physical condition. Now he was so tired that it seemed an almost impossible task to even lift a hand.

Laor Zak lurched to his feet. He tensed his muscles for another rush, then suddenly relaxed as he saw

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Kent's condition. The Martian's green-skinned face creased in a snarling smile of overwhelming relief.

"So it is finally taking effect, Earthman," he jeered, his voice sibilant with the hissing intonation peculiar to the races of Mars. "I was beginning to wonder if you were immune to *somnolian*. I slipped enough of the drug into the wine container this morning to knock out a dozen Earthmen."

Kent was dimly aware that somewhere behind him Isaac Morton was slumping to the floor in limp collapse from the action of the powerful Martian narcotic concealed in the *vardog* they had drunk in the laboratory. Cold fear galvanized Kent's dazed brain as he realized the peril of the situation. He fought with every effort of his will to drive his numbed body toward Laor Zak, but it was hopeless. He took one staggering step, then his muscles collapsed like rotten cardboard. He went sprawling helplessly to the floor.

He saw Laor Zak exultantly close in upon the shrinking figure of Ruth Morton. White-faced with fear, the girl swung one slender hand in a savage slap across the Martian's face.

"You beast!" The girl's voice trembled. "You unspeakable beast!"

Something in the utter loathing written upon the girl's drawn face brought Laor Zak to a halt. For a long moment he stood there staring at her, his eyes glowing in red fury, his black hair crawling on his high forehead.

"So I am a beast," he said finally, his sibilant voice cold with menace. "And you do not like beasts. You prefer Blair Kent. You have given me an idea, Earthgirl, and it is one that I am afraid you will live to regret. You and your beloved Blair Kent shall travel the Trail of the Beast—together!"

Kent's eyes drooped shut in spite of his bitter effort to keep them open. He heard, as from a great distance, the Martian's hissing laughter and Ruth's sharp cry of terror. Then black oblivion shrouded Kent's drugged brain.

KENT'S first waking sensation was of hearing his name called. His mind groped numbly for a long minute before he recognized the voice as that of Ruth Morton.

"Blair! Blair! Oh, Blair, wake up, please!" The desperate pleading in the girl's words shocked Kent's dazed brain back to full consciousness.

He opened his eyes. He was lying where he had fallen, near the center of the room. Ruth Morton, her wrists and ankles bound together, was lashed immovably to a heavy chair against the wall. Isaac Morton and Laor Zak were gone.

Kent lay there weakly for a moment, gathering his strength for the effort to rise. There was something missing in the scene, something that was of vital importance, but it was several seconds before his groping brain discovered what it was. When he did realize the nature of the missing thing, the knowledge sent fear surging over his heart in a cold wave.

The muffled throbbing of the power plant had stopped!

Kent lurched to his feet. Ruth answered the unspoken question written upon his drawn face.

"Laor Zak took the key-coil of the generator with him when he left," she said. "He drained the emergency batteries until they had barely enough current left to activate fully the building screen for an hour. Three-fourths of the hour is already gone, Blair. I thought you'd never awaken!"

"Where's your father?" Kent asked, as he began untying Ruth's bonds.

"Laor Zak took him along. He was still unconscious." There was despair in Ruth's low voice. "That Martian fiend has been planning something like this ever since we found the coronite. The terrific berating that Dad gave him this morning merely supplied the spark that finally set things off. He jeeringly told me the whole thing while you were lying there unconscious.

"Laor Zak's plan was to kill all three of us," Ruth continued. "When the rocket came he would report our deaths as accidental. With Laor Zak the sole survivor, and no one else

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knowing anything of the coronite discovery, there would be no reason for the Council to doubt his word. He intended to charter a private rocket on Saturn and come back later for the coronite.

"He intended killing you and Dad first, and postponing my death for several days." Ruth's golden skin flushed. "He was insane enough to believe that he could make me love him. Then that final scene showed him how badly he had been mistaken. He promptly planned a revenge that only the fiendish cruelty of a Martian brain could conceive—to shatter the protective screen of the building and then leave the two of us marooned here, to watch each other slowly travel the Trail of the Beast!"

Fear closed with gelid fingers over Kent's soul. With the slow draining of their protective screen as the batteries waned the air in the room would become tinged with the blue of the seething vapors outside. And with that blue-tinged air would come gibbering horror. The blue vapor was the breath of life to the weird metal-and-stone organisms of Titan, but to denizens of any other world in the Solar System the livid-hued mist meant a fate more hideous than a thousand deaths.

The toxic element was one that had so far defied analysis. To every standard test the atmosphere was excellently adapted to the needs of any oxygen-breathing organism. Fooled by this fact, the first visitors to Titan had carelessly stepped from their rocket without equipping themselves with respiratory protection of any kind.

Their first deep breath of the blue-fogged air had brought dire warning, but it had been too late. Before they could scramble back through the rocket's air-lock their bodies had undergone a complete and grisly transformation.

They had been normal Earthmen when they left the rocket.

Three minutes later, when they returned, they were shambling, hairy, apelike things—like the prehistoric creatures of early Earth.

SUBSEQUENT experiments upon animals had revealed the full effect of the blue vapor in all its abysmal horror. When taken into the lungs of any organism not native to Titan, the toxin of the blue mist instantly started an incredibly swift process of atavistic degeneration.

Processes of evolution that had required countless thousands of years were reversed in scarcely more than minutes. Several fatal accidents with the clumsy oxygen-helmets that were first used by explorers showed the hideous effect of the full cycle upon humankind. Men became apes, then pre-ape brutes, then degenerated into a series of invertebrate monstrous things, then on down, down, to a final climax of mad horror that culminated in a mere mound of protoplasmic slime that undulated in repulsive life for a few brief moments, then died.

It had been Arr Tohg of Venus who had discovered that a weak electrical field nullified the ghastly effect of the vapor, and his discovery made it possible for the first time to place research workers upon Titan in electrically-screened buildings such as that in which the Morton group had been housed. For use outside the building, respiratory masks were devised of wire mesh charged from light portable batteries worn in an attached head-clip.

Two of the respiratory masks of the Morton party were still on their pegs beside the front door. Blair Kent's heart leaped when he first saw them, then sank again when he found that they were useless. Laor Zak had taken every mask battery in the place with him.

Kent briefly inspected the silenced generator, and promptly gave up all hope in that direction. The tiny three-inch coil that the Martian had removed was an absolutely essential part of the mechanism. It could be replaced, but the fabricating of a new coil would take several hours, and they had only minutes left to them.

Ruth and Kent walked over to one of the front windows and, with arms about each other, stood staring out into the blue murk in dull despair.

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Somewhere out there in that swirling mist Laor Zak lurked, patiently awaiting the time when he could return and again make the building habitable. With the crazed Martian was Isaac Morton.

Unless Laor Zak had put a mask on his unconscious prisoner, Morton had died long before this. But even in that case, his death would have been mercifully swift compared to the fate threatening the two in the building, Kent thought bitterly.

In the full strength of the blue mist, the whole cycle of atavistic degeneration ran its grisly course in less than thirty minutes. Here in the building, however, with the waning batteries remaining partially effective until someone coming—out there in the Trail of the Beast would be a matter of hours.

That was the insidious cruelty of Laor Zak's revenge—for Ruth and Kent each to watch the other's slow and terrible transformation as the minutes and the hours dragged by, to watch the reversion to the primitive as human skin changed to animal fur, to watch graceful features degenerate into brutish snouts, and to see human bodies become hideous things that crawled gibbering on all fours. One of the most tragic phases of Titan's toxin of mad atavism was the fact that the brain cells succumbed last. Long after the body had become a monstrous thing of stark bestiality, the brain remained human and clear.

Ruth's sharp gasp roused Kent.

"Blair!" the girl exclaimed. "There's someone coming—out there in the mist!"

Kent followed the direction of her pointing finger. A dark figure was blundering doggedly through the swirling blue vapor. It staggered on for a dozen steps until it was near enough for the two at the window to recognize it, hideously changed though it was.

"It's Dad!" Ruth's voice was a cry of shuddering agony.

THE oncoming thing reached the front door, fumbled its way through the protective double screen, and pitched headlong into the room. Ruth's face was white with horror-stricken grief as she kneeled beside the limply huddled figure.

It still wore the clothing that Isaac Morton had worn, but there all resemblance ceased. Morton had already gone far down the dread Trail of the Beast. The form that sprawled there on the floor was a grisly pre-anthropoid thing in which the only spark of humanity was the pitiful expression glowing in the deep-sunk eyes.

Pinned to the back of Morton's coat was a sheet of paper roughly lettered in Laor Zak's angular script:

> A little object lesson, Earthgirl and Earthman, of the Trail that lies before you!

The pre-ape thing that had once been Isaac Morton was dying. A savage blow had broken its skull and shattered the battery of the respiratory mask that it still wore. The eyes beneath the shaggy brows glazed. The figure shuddered once, and then was still.

Ruth Morton's face was desperate as she rose to her feet.

"I'm sorry, Blair," she said tautly, "but I simply can't face it! There's a vial of toxite in the laboratory. I'd rather—go out—that way."

"Wait a minute!" Kent's voice was tense with sudden hope as he looked up from where he knelt beside Morton's dead body. "The boastful gesture of that crazed Martian has given us one faint chance of getting out of this!"

Kent came to his feet, with the shattered mask battery in his hand.

"Laor Zak wasn't quite thorough enough in smashing this," he said exultantly. "Two of the twelve cells are still intact. By putting one in each of our masks we can get by for at least half an hour."

"But what difference will half an hour make?" the girl asked hopelessly.

"We can use that half hour to go outside—and get the key-coil back from Laor Zak!" Kent answered grimly.

Ruth shrugged her shoulders. "We can try. But he has all of Titan in

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which to hide."

"We won't try to find him," Kent said tersely. "We'll bring him to us. We'll fake setting fire to the building. That will bring him fast enough."

The site where the building stood, with its back barely a dozen feet from the closed end of a narrow box cañon, was ideally suited to Kent's hastily-formed plan. The crystalline grey cañon sides were unscalable. If Laor Zak could be lured near enough to the building to enter the narrow space between the high rock walls he would be effectively trapped.

Ruth and Kent hurriedly assembled a pile of wooden fragments from broken packing cases. Donning their respiratory masks, they took their fire material out through the double screen of the narrow rear door that had originally been built as an emergency exit from the building in case the front door was besieged.

They spread the broken wood against the end wall of the cañon where the flames could not reach the building. They touched the fire off with a match, then fled around the building and along the narrow cleft between the towering walls to gain a position where they could flank the Martian when he arrived.

The scene around them was one that was utterly alien. The primitive organisms that made up the flora and fauna of Titan were as eerily strange in their composition as was the blue vapor that gave them life. The basic element of Titan's life-forms was a microscopic crystalline cell that was neither metal, stone, nor protoplasm, but a weird combination of all three.

THE slender spiky stems of the six-foot vegetation were of living metal that somewhat resembled iron. The odd, shapeless lumps of plastic black material that edged and rolled their way across the glittering grey soil—the lumps varying in diameter from a few inches to over a foot—were of living stone. Of insect, bird, or marine life there was none.

The scattered spikes of the metal trees offered no possible hiding place for Ruth and Kent, but near the mouth of the narrow little cañon there was a mound of grey crystal blocks where a large piece had weathered and fallen from one of the walls. Panting, they flung themselves down behind the rocky mass.

From tiny fissures in the cañon floor blue vapor surged upward in a cloud that obscured all except the bare outline of the building a hundred feet distant, but the glare of the fire was spectacularly visible, the blue mist acting as a giant reflector for the ruddy glow of the flames. The sight was visible for a distance of several hundred yards, and Kent believed that the Martian was lurking somewhere nearer than that. The atavistic changes in Morton's body had indicated that a very few minutes had elapsed between the shattering of his mask battery and his return to the building.

For tense moments that seemed eternities long, Ruth and Kent crouched behind their rock barrier. The only sign of life in the blue murk around them was the occasional jerking movement of one of the black blobs of living stone. Then suddenly Kent's fingers closed over Ruth's arm in a taut grip of warning. Someone, or some thing, was entering the mouth of the cañon.

A minute later and the tall form of Laor Zak loomed through the mist. The Martian passed within less than three yards of where Ruth and Kent were hidden. Kent's eyes glinted in satisfaction as he saw the bulging pouch lashed to the Martian's belt. There, in all probability, were the extra batteries and the precious key-coil taken from the generator.

They waited until Laor Zak had passed safely beyond them, then they slipped out of their hiding place in swift pursuit. They were within half a dozen steps of the Martian when Kent stumbled over the writhing lump of one of the animal stones. Startled by the sound, Laor Zak whirled and saw them.

Kent hurled himself forward in a charge so swift that the Martian barely had time to raise his arms before the Earthman was upon him. The

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Martian's left hand snatched viciously for Kent's respiratory mask. Kent snapped his head to one side just far enough to avoid the clutching fingers, brushed the Martian's right arm down with his own left, and sent his right fist crashing into Laor Zak's jaw with all the momentum of his charging body behind the blow.

The Martian hurtled backward and struck the hard ground with a force that momentarily stunned him. Kent hurled himself upon his fallen antagonist with the flashing leap of a jungle cat. He unbuckled the pouch with flying fingers, flung it back to Ruth, then leaped free as Laor Zak's big body writhed in returning consciousness.

The Martian recovered with startling swiftness. He lurched to his feet and stood there for a second, with his eyes blazing fiery scarlet and his serpentine hair writhing in mad fury. Then, with a sibilant snarl of murderous menace, he hurled himself at Kent. The Earthman met him with a flashing rain of pistonlike blows to the face that sent the Martian stumbling backward. Pressing his advantage, Kent leaped in. He speared Laor Zak's face with two darting left jabs, then crossed with a flashing right that again sent the Martian sprawling.

DEFEAT was written upon Laor Zak's green-skinned face as he came slowly to his feet. Then abruptly mad inspiration flashed in his glowing crimson eyes. Before Kent could divine his intention, one of the six-fingered hands darted up and tore the respiratory mask from the Martian's face.

"You have vanquished me, Earthman," Laor Zak snarled sibilantly, "but do you think you can vanquish the mighty ancient beasts of Mars?"

The Martian drew in a deep breath of the blue vapor. Kent realized then the grim menace of Laor Zak's desperate plan. The Martian was deliberately bringing hideous death upon himself, but in dying he was practically certain to slay the Earthman and the Earthgirl who had defeated him.

Kent leaped forward in a desperate effort to batter Laor Zak down before atavistic transformation made him impregnable. But he was too late. Startling changes had already occurred in the Martian's body. His green skin was now iridescently scaly. His face was the scale-armored visage of a giant lizard, with the skull hair so coarsened that its writhing mass resembled a nest of striking black adders.

Kent's fists glanced harmlessly off the armored head. Before he could dodge, taloned hands gripped him, snatched him aloft and hurled him into a thicket of metal trees ten feet away. Kent struggled to his feet. His only chance against the monstrous thing facing him was a club of some kind. Kent tore one of the long metal tree stalks out of the grey soil. With its rigid, inch-thick stem and mass of knobbed spiky roots it offered an excellent weapon.

The Martian was now a giant flame-eyed lizard-thing that fought in upreared man-fashion on its hind legs. Kent's frantic leap to one side evaded by bare inches the slash of razor-sharp talons. He swung his club in a mighty two-handed blow that sent the lizard-thing stumbling backward.

The battle that followed was a mad nightmare such as had never been faced by any other man in the Solar System—the battle of a modern Earthman against a swift succession of the frightful Beast - Thing that had peopled Mars back in the dim days soon after the red planet's birth.

Martian and Earthly evolutionary processes had been strikingly different. There was no trace of the ape in the atavistic trail that Laor Zak's body traversed. The things that confronted Kent were weird blendings of reptile and octopus, and each swift-forming change was more horrible than the one that had preceded it.

The minutes passed in eerie phantasmagoria to Kent's reeling brain. Staggering with fatigue, his body bruised and lacerated by talon and fang, he fought grimly on in a half-daze. Then suddenly he was aware

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that his grisly adversary was swiftly becoming less formidable. The atavistic trail had gone so far back that the life-forms were steadily growing too rudimentary to present overwhelming physical menace.

The form facing Kent now was a loathsome octopuslike entity with long black arms writhing around a pulpy white body-sac in which a single giant eye glowed baleful scarlet fire. Seeing a chance to end the battle, Kent leaped in and sent the head of his club smashing with all his strength at the vulnerable bulk of the pursy sac. The blow struck accurately home. The sac burst in a spurt of viscous ichor.

But before Kent could leap clear one of the wildly threshing arms caught him, tightened convulsively, and threw him bodily through the air. He saw the grey ground rushing up to meet him. Then his head struck with an impact that knocked him completely out.

Cool hands stroking his forehead brought him back to consciousness. He looked up to see Ruth's face bending over him.

"Take it easy," she said soothingly. "There's plenty of time. I loaded new batteries into our masks from the supply in Laor Zak's pouch. The key-coil was there too."

Kent got stiffly to his feet and looked about him.

"What happened after I passed out?" he asked.

"Not much of anything. Laor Zak was very near the end of his atavistic trail when you crippled him. There were only a few more changes. There is the final stage now."

Kent turned and looked, then shuddered. Laor Zak's body had reached the far beginning of the Martian evolutionary trail. It was now nothing but a surging mass of tiny protoplasmic worm-shapes that writhed for a moment in horrible maggotlike movement, then dissolved into milky slime.

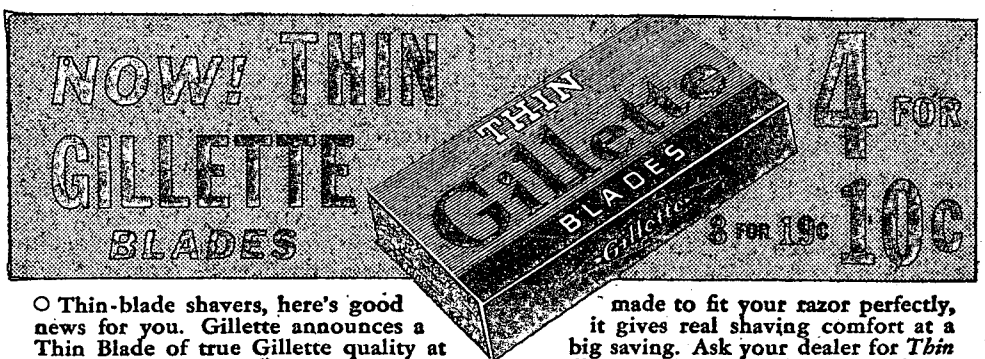
IN THE NEXT ISSUE

WHITE BARRIER

A Complete Novelet of the Next Ice Age

By FRANK BELKNAP LONG, JR.

—and Many Other Science Stories and Features



Thin-blade shavers, here's good news for you. Gillette announces a Thin Blade of true Gillette quality at a price you'll be glad to pay. Precision-made to fit your razor perfectly, it gives real shaving comfort at a big saving. Ask your dealer for *Thin Gillettes* in the new red-black package.

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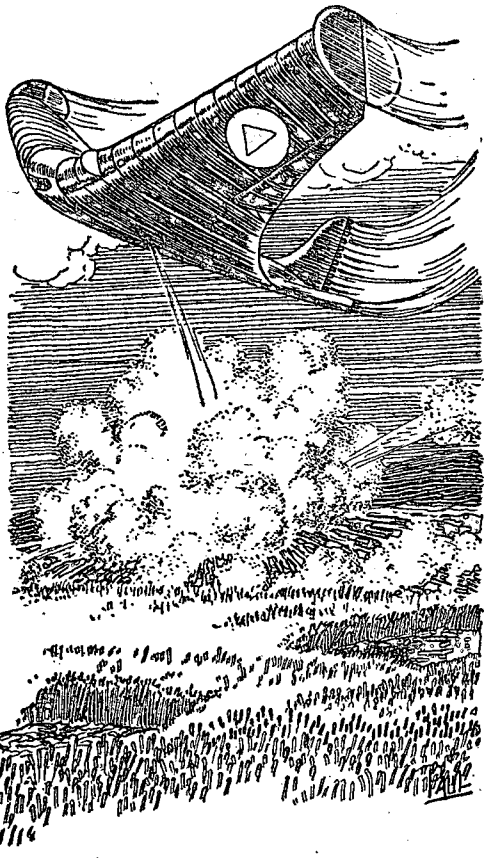
The WAR of the WEEDS

Doom Menaces Humanity When Vibrations of Death Descend to Earth!

By CARL JACOBI

Author of "The World in a Box," "Cosmic Teletype," etc.



Gage rushed forward with the machinery-laden cart

AT ten o'clock on the morning of May 3, 1956, Harold Field, hired man on the farm of Gustav Peterson in Carver County, Minnesota, was alone in the east field that skirts highway No. 7, seeding corn. Resting a moment to light his pipe, he was suddenly knocked to the ground by what seemed a blinding flash of light and a thunderous report.

When he opened his eyes, it was to gaze upon an upraised mound of earth, the center of which was pierced by a circular hole. Field moved forward, examined this hole and, failing to touch bottom, reported the matter to his employer. Peterson, who owned the property, had read something of meteorites and at once telephoned Professor John Calthay, who he remembered was vacationing in Victoria, three miles away. Employer and hired man then took shovels and went out to dig.

By nightfall they finally brought to the surface the object which had apparently fallen from the sky. Tapered at either end, it resembled a large shell, three feet in length, seven and a half

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inches in width. It was formed of a black, amazingly light metal.

Meanwhile Professor Calthay, who had won lasting fame a year before for his development of the "mechanist" theory of growth, rushed to the Peterson farm and with his assistant, Lawson Gage, was present when the cartridge was opened.

The cartridge and its contents made front-page news in every paper in the country. Inside the shell was found a hollow chamber, filled with a fine granulated matter that resembled ground coffee.

According to Professor Calthay, the Peterson shell reached the Earth from some point in outer space. Its construction pointed obviously to the work of beings of scientific intelligence, especially the middle core, which was formed of coronium, a substance discovered spectroscopically in the corona of the sun and known on this Earth only in a gaseous state.

On May 6th, under Calthay's direction a quarter acre of the east field was cultivated and harrowed, and one-half of the shell seeds sown broadcast. Results were startling. At the end of a week they had apparently reached full growth, an average height of four feet, six inches.

These weeds—and no other word adequately describes them—were of a peculiar shape. The top half of the plant formed an oblong protuberance, not unlike that of the common cat-tail, save that it was a brittle, reedy material and was hollow with a small opening on one side.

The odd part of it was that from the twelfth to the fifteenth of the month there was little or no wind. And it was not until the sixteenth that Calthay made his discovery.

The professor was sitting on the veranda of the Peterson farmhouse, where he had established his temporary headquarters, when Lawson Gage suddenly broke into his reflections.

"What's that funny noise?"

Calthay drew his pipe from his lips and listened. "I don't hear anything."

"It's stopped now. I've been noticing it for ten minutes. It seems to sound only when the wind blows. There—"

CALTHAY heard it then. High-pitched and wailing, there swept out of the field to his ears a distinct chord like the *vibrato* of a hundred clarinets. Then the wind died, and the sound ceased.

Calthay sat puzzled. A full minute elapsed before he jerked erect.

"It's the weeds!" he cried. "Come on!"

With Gage at his heels, the white-haired scientist ran down the steps and across the farmyard, heading for the east field. Arriving there, the two men drew up short.

Before them, densely packed, the weeds formed a gently undulating carpet. And issuing from the reedlike top blooms, the droning chord sounded like a great Aeolian harp.

Calthay whipped a knife from his pocket and cut off the nearest stalk. Holding it by the far end, he swung it to and fro over his head. The result was a thin, drawn-out scream.

"What the devil do you make of it?" Lawson Gage asked. He was a tall, dark-haired youth with gimlet eyes and a high broad forehead.

In silence the professor moved slowly through the field, cutting off bloom after bloom, studying them. At length he looked up.

"On the surface, the phenomenon is simple," he said. "The brittle tops of these weeds form an almost perfect musical instrument, and when the wind blows they give forth a sound. Each bloom is of a slightly different size, so the tones vary. But do you notice anything about the sound as a whole?"

Gage listened. "Yes," he said. "It sounds as if a high voice were saying over and over again, 'Doom! Doom!'" And so it did. . . .

Continuing his investigation, Calthay found that the weeds reached maturity within the brief period of eight days. A small pouch formed on the stalk then, which opened and spread more seeds to the wind. There was, however, no evidence of the weeds multiplying in any dangerous abundance, a fear which the professor had harbored since he planted the first lot. It was apparent that for successful growth, the earth must be first care-

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fully pulverized.

But by opening these pouches prematurely, planting them in a separate field and making a detailed catalogue of each planting, Calthay made another discovery. The seeds of each weed, he found, propagated a bloom of the exact size and tone-note as the original.

The scientist mused over this for some time until an idea struck him. Over the dinner table one night in the Peterson house, he spoke to his assistant.

"You used to be interested in music before you turned to science, didn't you, Lawson?"

Gage nodded. "Directed my college orchestra and learned to play the 'Moonlight Sonata' on the piano," he smiled. "But after that Einstein proved too great a lure. Why?"

Calthay toyed with his fork a moment, then turned to Peterson.

"Is there a fair grounds in the vicinity?" he asked. "Or a place where there's a grandstand that might be available for rent?"

Peterson stared. "Yes," he replied slowly. "The county fair grounds are at Carver, and there's a good-sized grandstand. But what on earth—"

THEREAFTER for the next three weeks, Calthay and Gage worked in mysterious seclusion. No inkling of what the scientist was up to reached the public until the twentieth of June, when the following notice appeared in the *Carver County Clarion:*

COSMIC SYMPHONY

CARVER FAIR GROUNDS AT 8 P.M.

ADMISSION FREE

Tonight, assuming meteorological predictions are correct and there will be a sufficiently strong east wind, I shall attempt a musical experiment with the Peterson space-shell weeds. The weeds which have Aeolion properties have been arranged in order of their proper tones, with the same attention to harmony as a pipe organ.

By means of draw-shades I propose to control the wind as much as possible and produce ear-pleasing results.

The public is cordially invited to attend this performance.

PROF. JOHN CALTHAY.

The draw-shades were seen by the first arrivals at the fair grounds as large sheets of canvas, strung in triple tiers on wires on the west side of the race track. The fact that these canvas sheets had originally been hay-covers, pressed into service from neighboring farms, detracted little from the public's general excitement.

But more than Carver County was present. The afternoon train brought representatives of the United Press and Associated Press, in addition to syndicate and feature writers, not to mention Sir Hammond Gore, the eminent music critic of New York City. Also there was Professor Albert de Carta, of the Federal University of Science, and Dr. A. T. Holwell, astronomical authority and author of "Can We Reach Mars?"

Inside the race track a curious sight was revealed. The entire oval arena, which was surrounded by a high board fence, was a field of densely packed weeds, four to five feet in height, all of them of a luxuriant green color. In the judges' stand before the grandstand Professor Calthay stood, his white locks streaming in the wind. At his side was the ever-present Lawson Gage.

After a short speech in which he spoke of the Peterson shell and its potentialities, Calthay gave a signal, and five of the draw curtains were pulled back. A steady east wind was blowing. The weeds in the arena began to wave and undulate. An instant later the audience sat electrified.

A high, melodious chord vibrated through the evening air. Swelling as the wind increased, it reverberated against the grandstand, growing louder and louder.

Up on the west wall of the race track, under the glare of the floodlights, six men on high ladders stood watching Calthay. After a moment the scientist waved his hand. Five curtains were drawn closed, leaving only one open space at the far side of the field.

Almost imperceptibly at first the song of the weeds changed. Slowly it mounted the octaves into a higher register.

The audience was buzzing with ex-

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citement now. Once again Calthay raised his hand to give a signal. But abruptly a hush fell on the grounds. Above them the crowd noticed for the first time a black storm cloud. The wind returned with a shriek, and simultaneously something happened.

IN the grandstand the crowd rose en masse, raced for the exits. Screams rose up—screams of agony and horror. Seats banged, crashed. A woman stood up, tore insanely at her hair. A man flailed his arms and dived headforemost over the rear wall.

"Stop it! For God's sake, stop it!" somebody yelled.

For five minutes the horror continued. Then the screams died, and the crowd quieted. But none lingered to find an explanation of what had happened. Filing in bewilderment out of the fair grounds, they stumbled into their cars and drove madly away.

Lawson Gage leaned white-faced against the wall of the judges' stand and stared incredulously at the professor.

"In heaven's name," he gasped, "what was it?"

The press went wild after that; and Calthay, in response to popular excitement, called a consultation of three scientists: Gedding, Harcolt and Durose; all of the Federal University of Science. Second, he published an admission of his error in the fair grounds incident. It was absurd, he declared, to believe one could control the amount of wind striking the weeds by such elementary means as shifting canvas curtains. The variation in tone must have been caused by other reasons.

But it was Lawson Gage who hit upon the channel leading to the correct answer.

"Undoubtedly," Gage said, "the thing that so upset the audience in the Carver grandstand was some form of sound. Now, we know that the highest sound the human ear can detect is forty-one thousand vibrations per second. The sensory portions of our brain do not register a vibration above that until we come to a frequency of three hundred seventy million million, when we begin to see rays of red light.

"It therefore stands to reason that ordinary sound, no matter how high-pitched above the ear's receptive capacity, would have no effect on the human body.

"But the thing which came from the space-shell weeds may have been more than sound. Isn't it possible that these weeds, as living organisms developed along an entirely different evolutionary scale, might throw off into the vibratory field some form of energy, which we of Earth cannot understand? Add to that that this energy, a botanical one if you will, is insufferable to the human brain, and you have it."

Gage may have had it, but the public didn't. Interest continued under force of newspaper sensationalism, then gradually waned.

But on July 16th—to use Professor Calthay's own words—hell broke loose. Three spies, unquestionably in the service of August Strausvig, dictator of the new Middle European Empire, were captured and tried in a military court at Washington, D. C. Two were executed. The third escaped.

And with the third man's escape was announced the disappearance of the Peterson shell, which it will be remembered had been resealed with half of the original weed seeds, and had been kept for convenience' sake in the Peterson farmhouse.

IN their room that night, Calthay and Gage discussed the situation.

"I should never have left the shell here unguarded," the scientist said, lines of worry showing in his face. "If my simple experiment in the fair grounds had such a terrible effect on people, who is to say what military-minded scientists might not do with those weeds, working along different lines? I tell you, Gage, the possibilities are horrible."

Lawson Gage nodded. "And not only to the world at large, but to ourselves."

Calthay stared. "What do you mean?"

For answer the assistant got up and went out the door. A moment later he returned to place upon the table a small black box, upon the top of which was mounted an ordinary alarm clock.

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"This," he said, "in case you don't recognize it, is an infernal machine, a time bomb. I found it under the house last night but decided to say nothing about it until now. The idea, I believe, was to blow us all to kingdom come."

"But why—who—". There was bewilderment in Calthay's voice.

"Nothing so difficult in that," Gage replied. "As you stated, some foreign power evidently recognized in those weeds a potential instrument for world power. They see in you the only possible person who could block their plans. So they intend to remove you and perhaps me, too, from the picture!"

And on the fifteenth of August the weed plague suddenly appeared in Ontario. Overnight, it was reported, vast fields of the strange weeds took growth, sown there by an unknown source. A week later the terrible sickness began to strike down the population. The plague was a form of madness, similar to that which had stricken the audience in the Carver grandstand, but a thousand times more virulent. Death came in a few hours. And the weeds seemed impregnable to all attack.

Life in the United States continued unchanged. And then in mid-winter the plague struck lower California.

"It's just as I feared!" Calthay exclaimed. "Some scientist with a brain trained to military destruction has developed those weed seeds. In their new form, they will grow apparently without the pulverization of the soil which I found necessary. Also they are much more powerful. Nothing seems able to stop them. They propagate faster than man can destroy them. And when they sway in the wind, they give forth their vibration and that strange energy which no human brain can stand. The one and only thing in our favor is the time of the year. It will be three months before the seeds can take hold in a northern climate."

Gage nodded tensely. "What are we going to do?" he demanded.

The question was never answered. A roaring crash sounded and the reading lamp at Calthay's side burst into a thousand fragments.

With a single leap the scientist was across to the door, running out into the yard. A tall shadow fled before him. Calthay, his aged legs moving like pistons, raced in pursuit around the west side of the barn and down the lane to the road.

"Stop!" he yelled. "Stop!"

Two more shots cut lanes of fire through the blackness. Calthay heard one of them whistle by a scant inch from his ear. But the shadow did not stop. It continued in long, leaping strides. An instant later the roar of a powerful motor sounded, and a car without headlights sped down the road.

"Close," Gage observed dryly. "If you'd been sitting a little nearer that lamp, that bullet would have got you."

NEXT day Calthay caught the afternoon train for Flagstaff, Arizona. Arriving at the famous astronomical observatory there, the scientist announced his mission.

"I want to make a spectroscopic analysis of the light from as many stars of the ninth magnitude as I can."

The first sign of the hysteria which was to follow was now finding its way into the press. Weed fields were springing up in California and New Mexico. Nothing seemed able to halt their advance. There were reports of planes sighted over the Mexican border, dropping small containers which opened when they struck the ground. The War Department had reinforced the border patrol, and National Guard units from three states were called into action.

In some localities the weeds apparently had no harmful effect. But in most cases the opposite was tragically the case. The population of entire towns was wiped out; asylums were being filled with gibbering idiots; inmates who had managed to escape told of a weird singing chord that seemed to drift on the wind. A chord that brought madness, ending in death.

The United States Department of Agriculture telegraphed Calthay three times, begging him to take charge of the fight against this mysterious men-

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ace. Twenty-six of the country's leading botanists were already at work, attempting to produce some means of preventing further germination of the weeds. But Calthay maintained a deliberate silence at his labors in the Flagstaff observatory.

It was on Christmas Eve that Calthay's work was rewarded with a discovery. In observing the spectroscopic color range of a ninth magnitude star, Melaris-A, through the recently invented Johnson magno-spectroscope, he found unmistakable traces of coronium.

Feverishly he turned the gigantic telescope, studying that section of the heavens. An hour later the scientist packed his bags and raced back to the Peterson farm in Carver County, Minnesota.

"Lawson," he said to his assistant a few moments after his arrival, "I've got it. You remember that the center core of that space-shell was made of coronium. Now, whereas all matter is generally equally divided over the entire universe, coronium is a very rare substance. Even in outer space there are few traces of it. But a spectroscopic examination of that light from Star Melaris-A shows its presence!"

"So what?" Gage interrupted skeptically.

"But don't you see? It means that that shell came from that star. Or rather from one of several dark planets which must be moving in an orbit around Melaris-A, part of another system."

"I still don't see—"

"Let me put it this way. The inhabitants of that planet evidently are faced with cosmic disintegration, which is gradually destroying their atmosphere. They want to make a complete exodus to another planet, and Earth is perhaps one of several likely for their needs and conditions. They realize, however, that the population of Earth is already large and would be in conflict with them—"

"I get it!" cried Gage then. "So they send out that shell filled with seeds, which they hope will kill off the population of Earth—"

CALTHAY nodded. "Exactly. But conditions here were not precisely as they had expected, and the seeds did not have quite the necessary potency. It remained for man, in his lust for world power, to develop the seeds and strive for that same purpose. We must stop those weeds!"

"But how?" broke in Gage. "We're back at the same question."

"And I have the answer to that question. The center core of the space-shell was formed of coronium. It was used because it has a negative effect on the weeds, preventing possible germination. In coronium, therefore, lies our weapon. I'll get in touch with Washington at once!"

* * * * *

Prior to 1952, the world's entire supply of coronium gas was limited to the volcano of Despliazzo, in Italy. In 1952 coronium pockets were found at Cotopaxi, Mexico, and in central Colorado. Immediately upon Calthay's secret report to the Secretary of Agriculture, all sources of this gas were tapped. Special stratosphere transports were dispatched to convey natural coronium to a temporary headquarters set up at San Diego.

On March 15th the fears of the world crystallized in a general all-wave radio warning, broadcast from Danzig, new capital of the Middle European Empire. The voice of August Strausvig, dictator, declared:

"The weed plague is a product of Middle European scientists. Only a minute quantity of the seeds at our disposal has been used. But they *will* be used to destroy entire foreign civilizations unless mass acknowledgment of the authority of our government is made. We have developed the weeds so that their potency will continue as long as we see fit. We give the world one month to decide. One month! Strausvig has spoken!"

Preparations during that month progressed with war-time rapidity. Coronium warehouses were established in New York, in Chicago, Minneapolis, New Orleans, Denver. Experimental bombardments of lower California weed fields already had been entirely successful.

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The listed stock of a manufacturer of spray guns skyrocketed thirty points as the company, through mass advertising, disposed of thousands of its products. Fake weed-destroying compounds and plague preventives appeared on the market in great variety.

On both coasts and on the Mexican and Canadian borders, anti-aircraft guns were set up at intervals of every few miles. The United States was arming in the strangest way it had ever known.

Then days of anxious waiting, confusing reports. Strausvig had disappeared! Strausvig was dead! The dictator would strike tomorrow!

Professor Calthay watched the developments with grim eyes.

"Isn't it ironic," he said to Gage, "that the people fear one man on the other side of the earth? But the trouble has its inception millions of miles out in space. And yet one menace is interdependent with the other, with civilization at stake."

April 15th, 1957, dawned, a gray day at the Peterson farm, with low-lying clouds and a threat of coming rain. Foreboding hung in the sky. The very air seemed charged with menace.

Calthay and Gage sat on the farmhouse veranda, gazing out at the fields. The east field was barren now, the original space-shell weeds having been destroyed with coronium. Although, as the professor had remarked, the precaution was unnecessary, since these weeds were of an entirely different type from those developed by the Strausvig scientists.

PROFESSOR CALTHAY had just lit his pipe, and Gage was idly turning the pages of a magazine when the sound came. Not the sound of weeds. But the low drone of airplane motors high up in the sky above the cloud level. Steadily it grew nearer, louder.

"Something funny about that," Gage said. "That's a six-motor stratosphere transport, or I'm a Dutchman. But it's coming down, and there's no ship scheduled here at this time of day."

He turned and ran into the house, to reappear a moment later with a pair of binoculars. Followed by Calthay, he moved out into the yard. And then the plane broke through the clouds.

Gage, focusing the glasses, gave a yell of surprise. "It's radio-controlled!" he cried. "See the helix-antenna? There's no one aboard!"

Straight as a bullet the plane shot toward the ground. And now the two scientists could detect the markings on the wings: the circle-surrounded triangle of Strausvig's Empire. At an altitude of fifteen hundred feet the plane abruptly banked and began to circle.

Then a trap opened in the bottom of the fuselage, and something plummeted downward like a falling stone.

"It's a seed bomb!" Calthay cried. "Get the coronium!"

But an instant later the two men stood stunned. The seed bomb had burst, and already before their eyes weeds were taking growth. Even as they watched the ground seemed to quiver, erupting greenish stalks which shot up, matured to full growth and multiplied with terrific rapidity. In a matter of seconds the field was an expanding sea of green, and a dull roar mounted into the air as the weeds swept forward on four fronts.

"Come on!" Calthay cried. "We've got to get the coronium. If a wind springs up and hits those weeds, the plague will start again. We'll all be madmen!"

They turned and rushed toward the barn. There they met Peterson and Field, his hired man. Feverishly they began the task of loading the metal coronium tanks into the rear of the Peterson truck. But Gage, after the last tank had been put in place, suddenly turned, a queer glitter in his eyes, and ran in long strides back to the house.

The truck rumbled out onto the field, Calthay and Peterson working like mad to fasten long nozzles with tube-metal hoses to the coronium containers. When they reached the field they stopped for a moment, appalled. As far as the eye could reach, the farm was a great sea of weeds. An ever-growing ocean of green, sweeping outward.

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Calthay's heart sank. They could never stop the enveloping advance with the little coronium they had. Indeed, even as Calthay looked, he doubted whether the coronium would have any effect at all on this new variety of weeds. All the preparations of the last month seemed in vain.

"Field!" he yelled. "Rush back to the house, get Fort Snelling on long-distance telephone and tell them what's happening. Tell them to bring every available tank of coronium gas there is in the district. Tell them to radio Washington. Call the governor. When the winds starts, the plague will sweep across the country like a thousand Black Deaths!"

EVEN as he spoke the wind came. As if to a magic touch the field of weeds swayed and gave forth a high singing chord. Like a huge chorus of contraltos the vibrations rose, louder and louder. And with that sound Calthay felt the madness, like a bulbous entity alive, beginning to eat into his brain.

Field and Peterson had fallen to the ground and were clawing at their hair, screaming insanely. The wind increased. The song of the weeds became a black cacophony of death. Calthay's heart began to race. He could feel his eyes bulging in their sockets.

And then the scientist heard a dull rumble. He saw his assistant, Lawson Gage, rushing forward, propelling a two-wheel cart, laden with machinery, even as the plane circled again to drop another seed bomb. Above it, resting on a wooden superstructure, was a large waferlike object, yellowish brown in color, from which a network of wires appended.

Calthay's cry was a feeble whisper. "Gage! For God's sake, run! I—I can't— The weeds—"

Through bloodshot eyes the professor saw that Gage's face exhibited no signs of madness. His eyes were gleaming with anticipation; he wore over his ears a head-set of strange, oversize earphones.

With a quick movement Gage halted the cart and brought out three more pairs of earphones. He snapped one over the head of Calthay, bent down and repeated the process with Peterson and Field.

To his amazement, Calthay found the vibrating madness in his brain had subsided.

"It's my own idea of a method to stop the plague," Gage said. "I've been working on it while you were at Flagstaff, but I said nothing because I haven't had a chance to try it out as yet.

"Those earphones will permit you to hear me because I'm talking to you through a microphone. They also neutralize the sound energy of the weeds at the same time."

"But how—" Calthay demanded. "How? The government has been experimenting for weeks on something like this, but failed. What's that thing up there? It looks like a gigantic seed."

"That's exactly what it is," Gage replied. "It contains thousands of partially germinated weed seeds held together in a collodion paste. All growth, as anyone who believes in the mechanist theory knows, is a form of energy. I discovered that the energy of the space-shell weeds is a negative energy. I'm fighting it with what I call the Gage-mass ray, a super-development of Goldstein's 'Canalstrahlen' and the Thomson 'Positive Ray.'

"By ionization of gas at a low pressure in a strong electric field, I can detach the negative electrons from the atoms, recapture those electrons by colliding them with charged particles and produce a neutral ray. That's what I'm doing inside that huge seed."

Gage had turned to the cart now and was working frantically over a panel covered with dials and switches.

"The neutral ray," he continued, "is adaptable to almost any form of transmission. A small part of it is deflected along a high-frequency electric current into your earphones. That neutralizes the madness striking your brain. Since light and sound are both vibrations—as is energy itself, in fact—I had no difficulty shunting the remainder into the vibratory field. In other words, I'm fighting the weeds through their own sound!"

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GAGE turned a dial and pulled a switch. A low drone rose up into the air. He pulled a second switch. The droning mounted slowly. Even with the earphones on, Calthay could hear it.

And something was happening to the field of weeds! Writhing as in agony, the top blooms were losing their greenish color, slowly turning black.

The wind became a driving gale. Mounting in magnitude, the horrible wailing chord rose higher. Again Calthay could feel the madness eating at his brain. The earphones seemed powerless to prevent it. He saw Peterson rock backward and utter a hoarse scream. He saw Gage's face go white, his teeth bite deep into his lips.

And then, with shaking hands, the assistant turned his control as far as it would go.

An arc of purplish flame hovered above the machinery-laden cart. The singing chord died away, and before them the weeds seemed slowly to dissolve into nothingness. A hush fell over the farm. A moment later, where the green stalks had been was only bleak desolation. . . .

"It's all over," Professor John Calthay said that night on the veranda of the Peterson house. "With Gage's machine and others which will be built like it, we can prevent the weed growth in any part of the country. The attempt of Melaris-A to annihilate the civilization of the Earth has been defeated. Strausvig and his Middle Europe can be fought on common grounds. The 'War of the Weeds' is at an end.

"And it's all through your efforts," the scientist went on, turning toward his assistant. "Once again, Gage, you have won over me in conquering a problem. What have you to say, my young friend?"

Lawson Gage smiled. "Pour me another highball," he said. "And don't hold the horses on the Scotch."

O

IN THE NEXT ISSUE

MADNESS FROM MARS

A Story of Alien Life

By CLIFFORD D. SIMAK

ALSO NOVELETS BY EANDO BINDER, FRANK BELKNAP LONG, JR. AND WARD HAWKINS—PLUS STORIES BY MANY OTHERS

WHAT HAPPENED TO CROSS-PATCH?

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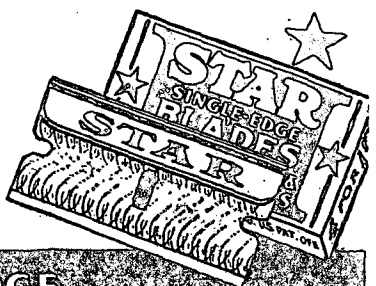

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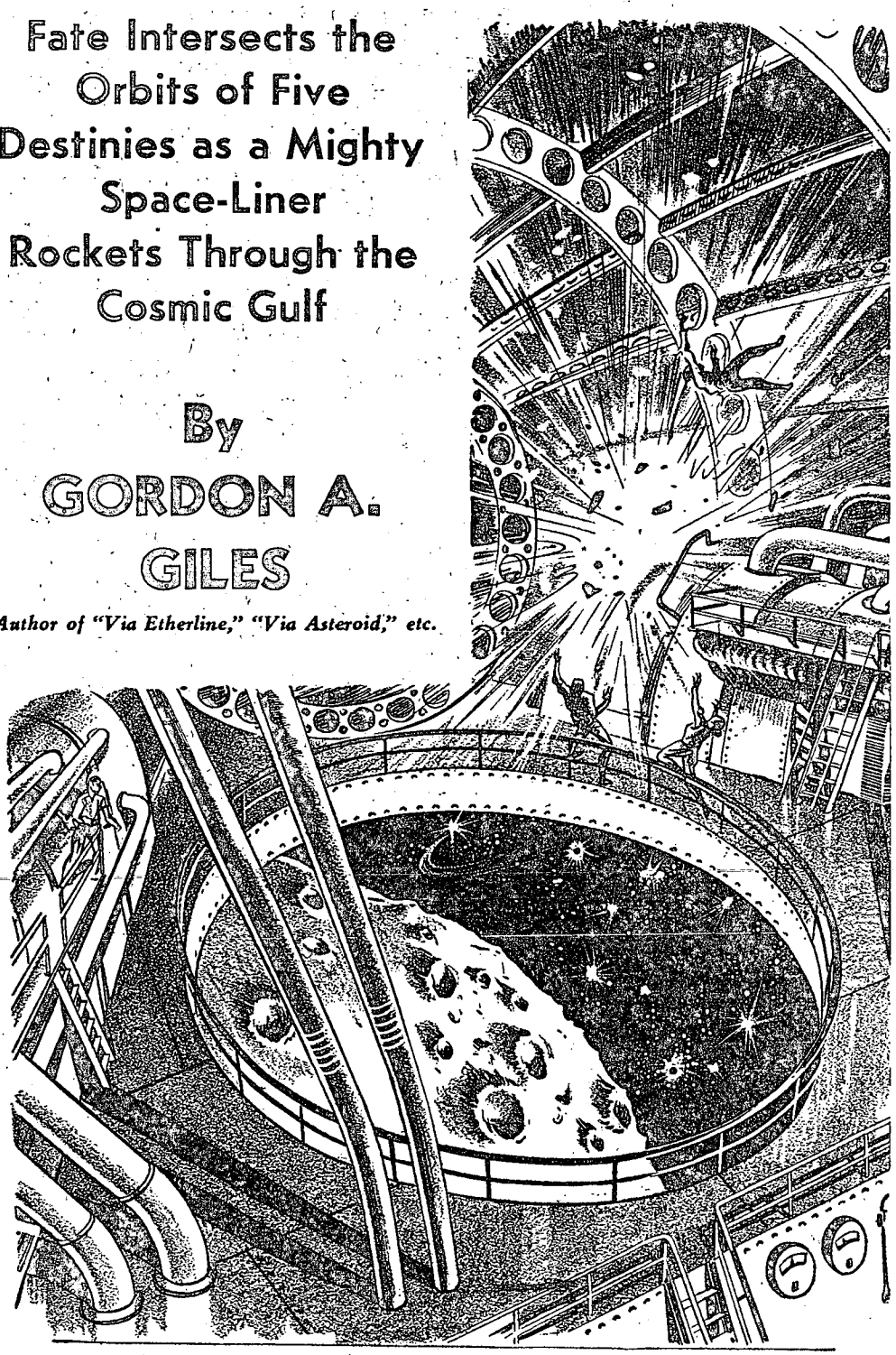
FLIGHT OF THE

Fate Intersects the Orbits of Five Destinies as a Mighty Space-Liner Rockets Through the Cosmic Gulf

By

GORDON A. GILES

Author of "Via Etherline," "Via Asteroid," etc.



A dull grinding thud thumped through the ship as the nose engine-B exploded

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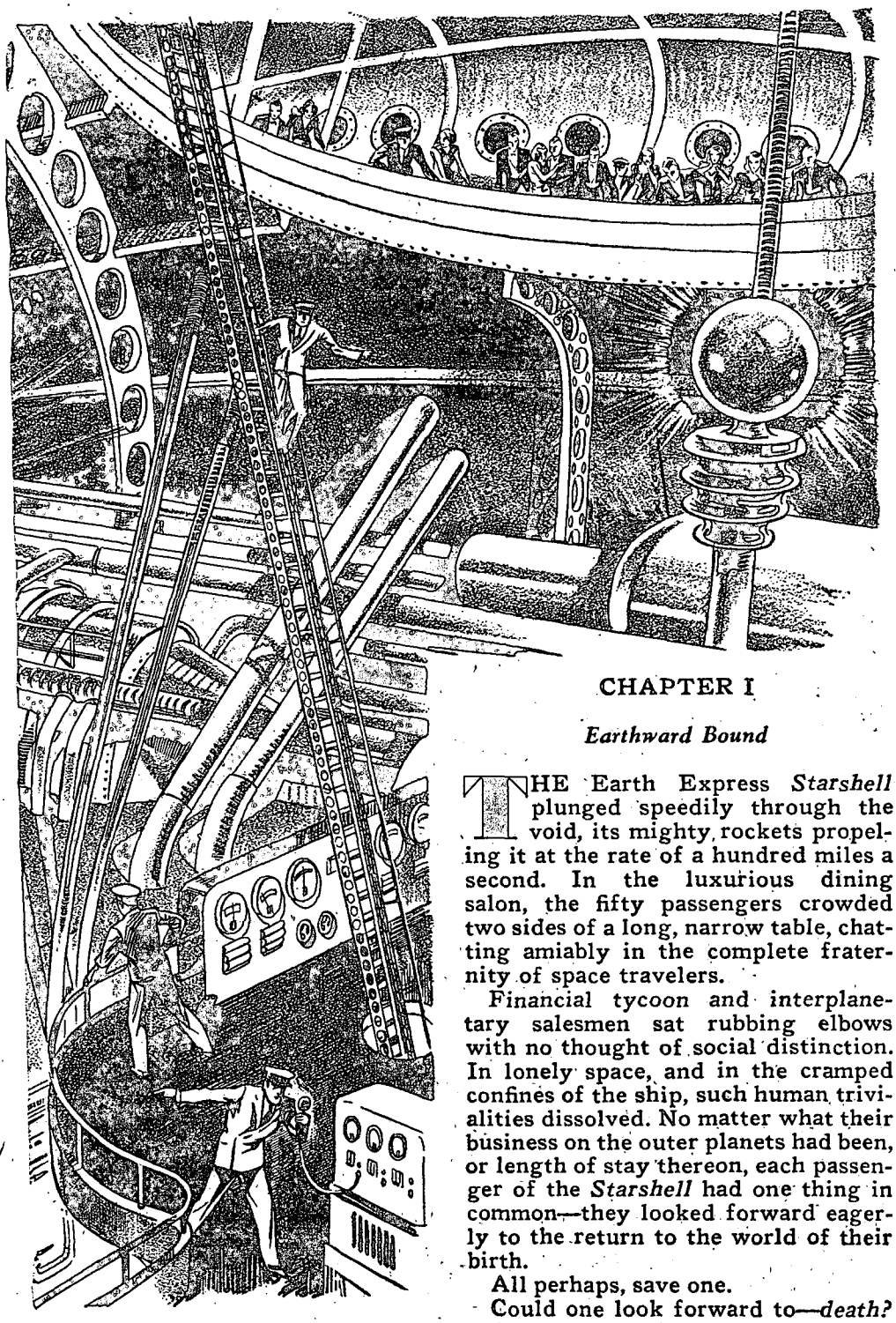
STARSHELL

A Complete Novelet



CHAPTER I

Earthward Bound

THE Earth Express *Starshell* plunged speedily through the void, its mighty rockets propeling it at the rate of a hundred miles a second. In the luxurious dining salon, the fifty passengers crowded two sides of a long, narrow table, chatting amiably in the complete fraternity of space travelers.

Financial tycoon and interplanetary salesmen sat rubbing elbows with no thought of social distinction. In lonely space, and in the cramped confines of the ship, such human trivialities dissolved. No matter what their business on the outer planets had been, or length of stay thereon, each passenger of the *Starshell* had one thing in common—they looked forward eagerly to the return to the world of their birth.

All perhaps, save one.

Could one look forward to—*death?*

Armand Karne's strong young face

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creased in bitter lines as he listened to the gay chatter about him. Earth was the favorite topic of conversation. "Dear Earth . . ." "No world like Earth . . ." "Trade you Venus and Mars any day for Earth. . . ."

But Armand Karne felt only a deep hatred for Earth and all it represented. Why not? It was dooming him, an innocent man, for a crime he had never committed!

The treadmill of his depressed thoughts revolved again around the events of three months before, on Earth. Vivid scenes—too vivid—flashed across his mind. The first one, that soul-stirring moment when he had stood stunned over the corpse of his laboratory chief, Professor Caldwell, the victim of an unleashed blast from their embryo atomic-power generator.

Investigation soon showed the radium-valve wide open, with Karne's fingerprints on it!

Then had come the nightmarish indictment. Grave accusations. Political enemies of Karne claimed that he had murdered Professor Caldwell so that he might succeed him as chief of atomic research for International Power. Partly groomed for the position already, admittedly brilliant, Karne had simply tried to force fate along, they cried.

Circumstantial evidence swiftly twined its ghostly fingers about his throat. How could he hope to expose the truth? How could he prove that his unscrupulous rivals had taken this means of eliminating him? How could he show that a wrench had been used on the valve-stem, leaving Karne's fingerprints intact? How could he—without money? Money was essential to battle the case, hire brilliant legal help, efficient detectives?

God! Was there no justice?

KARNE moaned a little, at the table of the *Starshell,* though fortunately the sound was not heard in the general babble. But the grim, taciturn man at his left glanced at him cynically. The Interplanetary Ranger Police were always cynical of their prisoners' thin explanations.

"Brother," he had said when Karne, finally caught, sobbingly protested his innocence, "men don't skip to Saturn's moon when they're innocent!"

Flight, Karne now realized, had been a serious mistake. The mark of guilt now branded him indelibly. But he had been driven to it, by a sensitive mind half crazed by the stigma against him. Insane with resentment at society, he had stolen away the day after his indictment, fled across the country. Pursued, he had stowed away on a Mars express, eluding the police for the time being.

Mars proved a brief haven. Then the Interplanetary Rangers had found his trail— Flight again, out into the dreaded deserts of Mars—near death from thirst—capture by Martian bandits—escape—slavery among Martian savages—torture and imminent death. Finally rescue by a Ranger plane.

Rescue! How ironic! Why hadn't they let him die among the savages? They were taking him back to Earth, at great effort and expense, just to die anyway. Did it matter where a man died? Those people babbling about Earth, green Earth, lovely Earth, did not know that to him Earth was—death! Death for a crime he had not committed! For the thousandth time he asked the gods of the Universe—is there no justice?

Something—an elbow—prodded Armand Karne in the ribs.

"Take it easy, Skipper!" came the calm whisper of the Ranger. "You've bent your fork like it was rubber and people are looking at you. Don't go to pieces, mister, or it's solitary confinement for you!"

Armand Karne nodded dumbly, forced his nerves to calmness, and his fellow passengers looked away. They did not know he was a criminal. The Rangers were considerate about that, at least. Karne tried to interest himself in the blessedly trivial conversation around him. Everyone seemed so content, so happy. If only he could be! If only he could be as radiantly cheerful as the enthusiastic young man across the table, who kept talking of

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the Canal Reclamation Project. . . .

YOUNG WILLIAM DARVY pounded his fist on the table for emphasis.

"Twenty thousand years old!" he repeated to his fascinated audience. "Yes sir, it's a Ripley, but true. Those canals were built twenty thousand years ago, at the height of White Martian science, by a disintegration process. The secret is lost now, or carefully hidden away. Anyway, it was a colossal achievement, considering that they had to dispose of enough rock and dirt to make a continent as large as Australia—and a mile high!"

After an impressive pause, he went on.

"These canals, bringing polar water to the equatorial regions, rejuvenated that dying civilization for ten thousand years. However, the desert race, the Green Martians, grew continually stronger. At about the time Earth civilization was crawling out of the paleolithic mud, in ancient Egypt, the Green Martians overran the White race, killed or enslaved most of them. Neglected, the canals soon fell into disrepair.

"Today, the canals have been reclaimed and rebuilt by Earth engineering. It was a big enough job, though nothing like the original project. The Green savages are pretty well driven back into their deserts. White civilization is again predominant, in coalition with Earth civilization."

The enthused speaker enjoyed the effect his dramatic story was creating. He went on.

"I had the honor of being assistant chief engineer in the reclamation of the last canal, named the Hallworth Canal in honor of the president of Earth's world-state. This canal links Mare Chronium with Thyle II, thus bottling the savages in Thyle I. We had armed guards at all times, and had some pretty skirmishes with the Greens. But in another decade or so that region will be as safe as other territory patrolled by Earth. Pocket battleships from the Chronium docks will steam down Hallworth Canal by next year."

He pounded his fist again.

"Earth can certainly be proud of what it's done for Mars. The Canal Reclamation Project has made interplanetary history!"

William Darvy subsided on this grandiose note and decided to get down to his eating. He felt proud of his part in the great project. But behind his pride in that was a great happiness. Just an hour before he had gone to the radio-room and sent a heliogram to Earth—to the sweetheart he had left two years before at the last Earth-Mars opposition.

"Meet me at the dock," he had written. "We will be married right away. Have thought of you every minute. All my love."

Two years they had been apart! He hadn't seen her, touched her, kissed her, in all that time. But now they could afford to get married. He had a good job, and money saved up. His dream come true! He loved her madly, and she loved him, of that he was certain. Hadn't she told him as much, two years ago?

Little William Darvy knew that his dream was to be shattered, the dream he had nourished, slaved for on an alien world for two years. Knew not that the beautiful blond girl who read his message laughed scornfully and handed it to the man who had his arm around her, back there on Earth.

Living in his borrowed heaven, William Darvey surveyed the women passengers at the table. But only to assure himself that not one of them was half as lovely as his Judith. No, not one. Not even that very attractive red-haired girl whom all the other men eyed surreptitiously . . .

CHAPTER II

Strange Destinies

ERLENE EDGEWOOD pecked at her food listlessly, femininely aware that she was the cynosure of all

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male eyes, but at the same time more concretely aware that at her right sat her stern father, and at her left her soon-to-be husband. Both of them discouraged even the simplest of flirtations by their very presence.

In keeping with her red hair, Erlene had always been headstrong and self-willed for the twenty-three years of her life. She had rejected the proposals of scores of men. Those who were poor, in her opinion, were after her money. Those who weren't poor, weren't men. At least, they didn't measure up to her ideal.

Perhaps it was odd for her to have an ideal. That went back to the medieval times of the 19th or 20th centuries, or thereabouts. But she did, and was willing to wait for him to happen along in her life. But her father had different ideas. In his opinion a girl was a spinster at twenty-three. They had quarreled often over the question. Finally, he demanded that she marry in her own circle. And it was precisely in that circle that Erlene knew she would never find her ideal.

A year ago her father had given his ultimatum. She must marry John Bedlow III, of staid Boston society. If she refused, she was to be disinherited. All his other daughters, five of them, had obediently married his choice of husbands; why shouldn't she?

Erlene glanced sideward at the profile of John Bedlow III. He was suave, well-mannered. But he was dull, an oaf. There was not one spark of animation in him. To escape him, she would gladly marry almost any other man, she thought rebelliously, but futilely.

Why, even that bald, blank-faced, goggled man across the table would be more interesting . . .

THE expression on Alfred Pearson's face was not one of vacuity, as interpreted by the girl. Rather, it was one of haunted study. He scarcely realized her existence, nor of the fifty others on all sides. He carried a burden on his soul, one that crushed his spirit.

Sir Alfred Pearson, Earth's ambassador to Mars, was traveling incognito, in disguise. No one aboard realized who he was or they would have been thrilled to be in company with this great man.

For twenty years he had been ambassador. For twenty years he had deftly molded diplomatic relations between Mars and Earth. But now the White Martian civilization muttered openly against possible domination by the Earthman.

It was the old story of resentment against authority, once its beneficence had been exploited. Freed of the Green Martian menace by Earth's aggressive campaign against them, the White Martians were quick to demand their independence.

For twenty years Sir Alfred Pearson had soothed the friction between Mars and Earth. But now, he was mentally haggard, haunted by a little document bearing the radium-seal of the White Martian Tribunal, its highest court. They had tried and condemned an Earthman to death, for the first time. His offense was perhaps deserving of that fate, for, a millionaire, he had stolen, by legal trickery, a large tract of radium-bearing land from its rightful Martian owners. The scoundrel deserved death, yes—but Sir Pearson shuddered at the consequences.

When the defiant document was delivered, Earth would not tolerate this violation of an Earthman's sovereign right to live. There would be war between two great worlds! Between two powerful civilizations!

Sir Pearson had argued eloquently with the Martian Tribunal. But the court had been adamant. They had given him the belligerent document for delivery to the World-State Council on Earth, temporarily severing all relations between the two worlds.

Alfred Pearson moaned a little, his mind weighted by his Herculean responsibility. He tried to eat the moonflower salad before him, to answer the conversational sallies of the lady at his left with more than low grunts, but it was no use.

He continued to brood over the puerility of the whole thing—a mere

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piece of paper to cause a holocaustic war! Several times he had been tempted to throw the document out into the limitless void. Undelivered, Earth would not know of this treason. The prisoner would be executed on Mars, the matter smoothed over adroitly by Pearson himself at a later date. And then, perhaps, in a few years he could bring Earth and Mars to a solution of their relationship.

But Alfred Pearson found himself first of all an Earthman. Some inherent feature of his character grimly refused to take that underhanded course, even though he realized it might be for the best. He shuddered at the thought of going mad before the trip was over. The dilemma was driving him crazy!

Perhaps they would land him on Earth as a deranged creature. He wondered whether he would look like that old fellow in the wheelchair, who was being fed like a baby by his valet. . . .

COMMANDER Alamo Jackson was a hopeless paralytic, with arms, legs and body useless. Mind, too. He was not old, but was white-bearded, wrinkled and yellow of face. His attendant fed soft foods to his quivering lips and toothless gums. His vacant, rheumy eyes were almost blind. He was a pitiful picture, a broken hulk of a man, more fit for the grave than for life.

Yet somehow, one could not fail to see that he had once been a man of men. Even yet his shoulders were broad, powerful. His great, gnarled hands gripped the arm-rests with muscles that must formerly have been of crushing strength. The lines of his big body, though wasted, were those of a one-time athlete. His face, too, showed beneath obliterations of pain and illness an aristocratic uplift of brow, strong chin, and formerly intelligent, shrewd eyes.

At times he spoke, though his fogged brain was only dimly aware of those around him. His cracked voice had the overtones of a once stentorian bellow, and the subtle tinge of the authority that had been his in previous days. His words were rambling, dim reflections from a glorious past.

Those around him accorded him due respect despite the sad picture he now presented. They whispered to one another of his epic exploits. Not three years before he had been the leader of the gallant Pluto Expedition, first to set foot on that incredibly distant, bitter planet. Previous to that, since the age of twenty, he had been one of interplanetary history's heroes—a trailblazer of the spaceways. In this one man was rolled the entire challenge of Earthmen to the Solar system.

Lindbergh, Columbus and Daniel Boone in one, he had amazed a world with his daring ventures. He had led his hard-bitten, heroic crews from one planet and satellite to the next, exploring, fighting, founding settlements, putting the stamp of Earth in a dozen inimical, alien environments. A horde of pioneers had followed his hard-won trails, thankful for his earlier explorations.

His resourcefulness and strength became almost mythical. On Mars, he had routed twenty Green Martian savages single-handed by wading into them with a wooden club as his only weapon against their knives and axes. On Venus he had strangled a full-grown winged tiger-dragon. He had tramped a hundred miles on mighty Jupiter, laden with an air-helmet, to rescue a lost man.

On Uranus, without fuel and marooned, he had driven his weakened, despairing crew to pump the atmospheric methane into their tanks and thus manufacture enough power to plunge sunward. He had returned from Titan a gaunt skeleton, the sole survivor of a crew of men dead from starvation and hardship.

Earth had soon come to recognize Alamo Jackson's value. He was given lavish equipment, commissioned to dangerous expeditions. He had been feted, honored, decorated, given scores of medals. His name was destined to echo down the halls of fame and time.

BUT now, that was all of the past. No more could he pit his strong body against perils, his ingenuity

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against impossibilities, his courage against the challenge of the Universe. He was doomed to sit weakly in a chair, an invalid with only half a mind, a pathetic shell of his former self.

There had been a sudden crash during the Pluto Expedition, his last great exploit. He had been seriously hurt, losing most of his mental and physical abilities. His men had finally struggled back to Earth, sadly delivering the crippled wreck of a man. His spine healed from its damage, but there remained a lesion of the brain that made him a paralytic. Earth's government, in recognition of his great services, had done all in its powers, sending him to various specialists for cure. All without avail.

As a last resort he had been sent to Mars, to the great Martian surgeons. They, too, had given up, for the delicate brain operation necessary was beyond their skill. And so Commander Alamo Jackson was being returned to Earth, doomed to his wheelchair.

His mental state was a curiously variable one. Much of the time he muttered to himself vaguely, totally unaware of his condition or surroundings. Again, he would have lucid intervals, complain against the wheelchair, talking rationally to his valet about it. This man had attended the spaceman for three years and his eyes were sad with an infinite pity.

At the table—which Commander Jackson in one of his lucid periods had insisted on attending—heads turned his way as his weakened but firm voice spoke out. He began telling of his Pluto exploit. His audience's eyes gradually shone with the excitement of his modest, stirring narrative.

Suddenly the invalid's tones changed as he told of the space ship plunging down out of control. He stopped. A bewilderment came into his eyes. Then his cracked voice went on querulously.

"What is this chair I'm in? Who has put me in it? By Jupiter, I'll crack the skull of the man who has done this. Let me out, do you hear? Let me out!"

His voice had risen in insane rage, and all could see how he strained to rise from his chair. Suddenly he relaxed, became quiet. A tear rolled from each of his dim eyes and followed the furrows of his cheeks. He began mumbling aimlessly, lost again in a deep mental mist. The valet silently wheeled him away, while people became suddenly intent on their food.

CHAPTER III

Life and Death

THE dinner over, the group broke up and dispersed through the ship, some to their cabins, others to the promenade deck and general lounge. Fifty people, each with individual thoughts, hopes, troubles. Among these fifty, five were meeting a crossroad of fate upon arrival on Earth. . . .

Armand Karne had no hopes, only bitterness that he must die by man-made laws, though innocent, hating the Space Ranger beside him for what he represented.

Not knowing he had been betrayed by the girl he loved with all his romantic nature, William Darvy roamed through his air-castles, too intent to notice any other woman.

Erlene Edgewood contemplated kicking John Bedlow III in the shin just to embarrass him, and wondered why her ideal, for whom she would gladly sacrifice every penny of a million-dollar inheritance, did not happen along in her life.

So nervous that his hands trembled, Sir Alfred Pearson told himself again not to be an utter fool and deliver that worthless scrap of paper which would start the millstones of war to grinding, and again heard an inner voice roaring "duty."

Commander Alamo Jackson beat with weak hands at the embracing wheelchair and cried for someone to release him, while the sad look in his valet's eyes grew deeper.

The *Starshell* plunged on, negotiating the black gulf between Mars and Earth in rapid time. It had been sev-

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eral weeks since she had left her first port, Saturn's outer moon. The nose rockets began to thrum powerfully. Passengers were obliged to cling to conveniently placed hand-rails and straps in the artificial gravity-field. The moon hove to at starboard and became a huge, silver bubble among the stars, its face pock-marked from an ancient geological disease.

Earth grew out of the void like a rare green blossom, with gossamer puffs of cotton white over parts of it.

The promenade deck now became popular and most of the passengers sat under the long, clear observation ports, watching eagerly as their home world bulged out of the surrounding inimical nothingness. Many emotions misted the eyes of the passengers. . . .

Armand Karne, face wan, gazed at earth and visioned his body writhing in agony as electricity burned his life out. William Darvy, smiling radiantly, gazed happily in his mind's eye at his beautiful bride in white beside him. Erlene Edgewood sighed dismally as she imagined John Bedlow III across the breakfast table from her, emptily talking about nothing she cared to hear. Sir Alfred Pearson's worried face became yet more haggard as he visioned fleets of Earth's warships winging grimly to Mars. Commander Alamo Jackson's heart gladdened—home at last after that long, dangerous exploration on Ganymede, or was it Neptune?

The *Starshell* slowed down more than usually to give the passengers a longer view of the moon. It was rarely that the moon lay in a ship's course and most people had never seen it this near. Velocity was cut to a mile a second, to remain within the gravitational field a while longer.

The passengers looked down on the shuddery desolation. Crags, precipices, towering mountains, deep gullies, and craters stood out with cameo-cut clarity in the whiteness and blackness of the airless satellite. Not a living thing moved on its arid, unweathered surface. Many crews of the earlier, cruder space ships had found death there.

The *Starshell* finally uptilted her nose and swung toward Earth. Five hours later there was to be a bisection of their orbits—and a bisection of the courses of fate for its occupants. . . .

For Armand Karne, *death!* For William Darvy, *blasted dreams!* For Erlene Edgewood, *stifled life!* For Sir Alfred Pearson, *dilemma!* For Commander Alamo Jackson, *invalid's misery!*

And then—

Boom!

A DULL, grinding thud thumped through the ship as nose engine-B exploded, instantly killing three of the crew on duty. With a sinister *whoosh,* air rushed out of the hull rent into the greedy maw of space.

Pressure-stats connecting to the corridors leading to the rear part of the ship instantaneously clicked, and ponderous felt-lined steel doors promptly hissed shut. The passengers' quarters in the rear, and the rest of the crew were safe from asphyxiation, thanks to the robot emergency controls.

The captain of the ship picked himself out of the corner he had been thrown into, too stunned to be frightened. He snapped his eyes across his instruments and caught his breath again. Not so bad! The explosion had localized itself, thank God, in engine-B room. He had lost three men, but the passengers were safe—

Then he staggered back as his eyes flicked to the altimeter gauge, now registering height above the moon. God in heaven! The dial numbers were decreasing at a swiftly mounting rate! The titanic blast of the explosion at the nose had, by reaction, cut the ship's velocity in half. They were caught in the moon's grip, were dropping to its jagged surface—

The captain darted to his desk, snapped on the inter-ship phone system.

"Rear engines blast away immediately!" he roared into the mouthpiece. "Life and death—hurry!"

But no answer came from his crew.

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The captain turned a sickly white. No buzz came from the phone at all—it was dead! His communication with his crew was cut off. And they were probably awaiting his orders, wondering, hoping, instinctively alarmed despite the absence of instruments to tell them what was happening.

The captain moaned. Why didn't his chief pilot, in the auxiliary pilot cupola, give those orders? He had an independent phone system. It was impossible for both to be out of order. And his duplicate instruments must be showing the same near-disaster—

The captain did not know that his chief pilot was lying unconscious, crumpled against the wall he had been thrown against. Yet there was only one thing to do, he knew, and in a moment he was racing down the corridor toward the rear of the ship. An emergency door blocked him, jammed though the air-pressure was normal.

Cursing softly, the captain was forced to climb the nearest companionway and enter the passengers' observation deck. It would take him longer this way to reach the rear engine compartment.

Only seconds left now—

Strangely, the observation deck was quiet. Dazed passengers, some just being helped off the floor, were still shocked into silence by the terrific force of the explosion. The captain, running down the long, wide deck, tried to keep from looking out of the great port-windows, but failed. He looked—and gasped.

The sky-filling expanse of jagged Lunar topography was rushing at them swiftly, inexorably—

"Captain!" a quavering voice called. "Captain! What's happened? What—"

As though this were a signal, other passengers began to scream out frantic questions. One man grasped the captain's arm, tried to detain him. The captain lashed out with his fist, the quickest way to free himself, and raced on, dodging past terror-stricken passengers.

HE came to the end of the long deck, leaped over the supine form of a wasted, white-haired man beside an overturned wheelchair—

The captain took one last look out of the port-windows. With a ghastly certainty, he knew there was no hope now. No chance of reaching the engine room in time to have his waiting crew ram power through the rear rockets. A stupendous, needle-spired mountain peak loomed up, directly before the ship. Ashen-faced, the captain grasped the door-handle, twisted. It too was jammed!

Then—the crack of doom resounded!

The *Starshell* shuddered violently through its whole length, plowed for half a mile through soft stone, like a knife cutting cheese, and brought up abruptly with only its rearmost fin sticking free. The incredibly tough hull-metal used in space ships had once again proved its tremendous strength. A fortuitous landing in a smooth pumice-flat, and her horizontal speed, had saved the *Starshell* from utter demolition.

The violent landing tossed the ship's human occupants around like bits of cork. Fortunately, the hull section adjacent to the observation deck withstood the battering and did not crack open gapingly anywhere. Somewhere, however, a tiny split seam began to let out air gradually with a sharp whistle. And down the deck from the rear came curls of smoke—one of the fuel tanks had split and caught fire!

The captain, face bloody from a cut over the eye, came to consciousness fighting for breath. Each searing inhalation drew sharp, chemical smoke into his lungs. Never before faced with such a great and terrible emergency, he became a babbling, cringing wretch, devoid of the slightest initiative. He knelt there, staring horror-eyed at the groaning, screaming passengers, rocking his head in his hands.

It was a time for leadership, command. For quick, decisive action. There was still a chance to save many lives, if only one man would rise to the occasion.

Commander Alamo Jackson struggled to his knees, staring around in bewilderment. He had been thrown

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from his wheelchair against a bulkhead with crashing force, striking against the back of his head. It was a blow that might ordinarily have killed a man. But in the case of Commander Jackson it served only to give the brain within the skull a terrific jolt. He stared around in bewilderment, slowly shaking his head—

Suddenly his daze vanished. Almost at a glance he took in the situation. His eyes flashed fire. The brain behind them, suddenly released from a lesion that had pressed upon it for three years, began working with lightning rapidity. And with the lifting of the fog before his brain, his physical paralysis also disappeared, for that had been cerebral in origin.

He staggered to his feet, surprised to find them weak and unsteady. Then he remembered and a great surge of upwelling joy flowed through him. He looked at the wheelchair—his prison for three years, but no longer! No longer was he an invalid, no longer a pitiful half-idiot—

THE old man shook his head again, brought himself down to earth. There were things to be done here, or he would be a dead man among other dead men. His voice, stentorian once more, bellowed down the deck.

"Listen to me, all of you! No time to moan about this. We can save ourselves if we work fast. Do you hear me?"

The passengers quieted in surprise, looked at him wonderingly. What did this mean, coming in such commanding tones from one who had been a wheelchair invalid a few minutes before, useless of mind and body? As they looked at him, they sensed the change that had occurred in him. Their faces became hopeful, eager.

Only the captain broke the stillness, now laughing hysterically. Commander Jackson strode to him, picked him up by the shoulders with his two great hands and shook him like a rag doll, hissing scornful curses in his face. The captain sobered, pushing feebly with his hands.

Commander Jackson released him and again whirled to the passengers.

"Women and children to the central lounge, quickly!" he roared. "Men, with me! Half of you look for that leak, stop it with rubber or leather. The rest of you men follow me. We'll put on space suits and put out that fire. Let's go! And the first man that lays down on the job gets this!" He held up a brawny fist.

Hypnotized, strengthened intangibly by that great, booming confident voice, the passengers changed from panic-stricken sheep to willing soldiers. Commander Alamo Jackson flashed his eyes over them joyously, though the moment was grim.

Once again a leader! Once again men jumped at his command! Once again he was pitting indomitable human skill against the blind forces of nature. Once again—he was a man!

CHAPTER IV

Flight's End

IN ANOTHER part of the ship, not so fortunate a section as the observation deck, a sharp ledge of rock buried in the pumice had stove in one quadrant of the hull. The automatic emergency locks had immediately sealed off this airless compartment from the rest of the ship.

Armand Karne, at the moment of landing, was thrown limply against the wall of his stateroom. He had instinctively ducked his head, taken the shock with his shoulder, and sprang up nimbly. He was almost carried off his feet in the next instant by the outward rush of air. He found himself gasping like a fish out of water.

Panic struck him, blinded him, made bubbling moans arise from his aching, deflated lungs. Then, in a flash, he took a grip of his terrified self, remembered the detailed instructions all passengers were given before departure.

Jerking open the panel of a wall pocket, he dragged out the outfit therein, hastily strapped the small oxygen bottle to his chest. Then, with

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senses already swimming, he slipped the rubber mask over his nose and mouth, twisted tight the tourniquet arrangement until his flesh was bruised. A twist of the bottle valve and a sharp stream of the compressed air-gas bathed his air-tight mask.

He filled his lungs gratefully with the sweet vapor. Saved! Then his eyes encountered the figure of the guard, the Ranger, gasping and twitching on the floor. Saved—only for a later death on Earth! Only for an instant did the lightning thought hover in Karne's mind that he could very well let the man die, and be free of his clutch. He shrugged. In another half minute he had fitted a second mask and bottle outfit to the Ranger's face, and twisted the valve.

The strong oxygen quickly brought the man to his senses. His eyes stared about, took in the situation, then turned to Karne, startled, wondering, with an unvoiced thanks in them. Karne jerked him to his feet, waved a hand and sprang out into the corridor. They must get to the aerated portion of the ship—if such there were—as soon as possible, for the small bottles would not sustain their breath for more than ten minutes.

The Ranger grasped Karne's arm outside their room. With gestures and jerks of his head, he suggested that they look in other staterooms for possible rescue of others. Karne nodded and they separated, each going in the opposite direction down the long, airless corridor.

Karne jerked the first door, peered in. Empty. Occupant probably on observation deck, there safe or dead. The next dozen staterooms were empty. He came to the end of that corridor and opened the final door. His eyes jerked wide. Three in here!

They lay still and white, unbreathing. Karne swept the two air-masks out of the wall receptacles and dived for the first figure, fitting one mask. Then to the second. The third did not need a mask. He lay with his head unnaturally twisted, and Karne knew that if he moved the body, the head would hang horribly to the chest because of a broken neck.

THEN he sprang back to the first figure, kneeled over it, pumped the diaphragm exactly as one would resuscitate a half-drowned person. A few gasping breaths rewarded him after a minute, and when the breathing continued without his aid, Karne jumped to the second figure and brought him to life.

Karne got up, sucking in his air-stream pantingly from the exertion. They were both still unconscious, but breathing regularly now. He kneeled beside the first figure again and began chafing the wrists. Then, though he hated to do it, he slapped the face stingingly, again and again.

At last a pair of blue eyes opened and the red-haired girl sat up, bewildered. She glanced around the room, at the figure of her father, then at the figure of the weak-chinned man with the broken neck. Horror flooded her eyes; horror, but not anguish. John Bedlow III would not be her husband after all—

Then she looked back at her rescuer again and smiled, though the smile was not visible behind her rubber mask. She watched him as he bent over her father, slapping his face till the stinging blood had wakened his dazed brain. She watched him as he helped them both to their shaky feet.

And all the while that she watched, her heart beat more and more strongly. This man—she knew it in a sudden flash—was her ideal! At the brink of eternity she had found him!

SIR ALFRED PEARSON'S nightmare of endless struggle in a sea of choking blackness ended as he was washed ashore on a beach of exquisitely sweet honey. But it wasn't honey; it was oxygen, forced into his starving lungs by the Ranger who knelt over him. Sir Pearson gazed gratefully into his savior's eyes, then struggled to his feet.

The Ranger tugged at his arm, gesturing toward the corridor. Pearson followed, but remembered suddenly and turned back. He gasped then at the sight of the ruined tangle that had been his stateroom. By the veriest hair-breadth, he himself had escaped

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being crushed to a pulp. The stove-in bulkhead had crashed through the composition walls, ground them to bits, gouged through the floor. Bunk-bed, wall-cabinet, wardrobe, suitcases—all had been destroyed.

Also a certain briefcase and a certain document stamped with the radium seal of the White Martian Tribunal—

Stunned, but with an ecstatic joy stealing through him, Sir Pearson allowed his rescuer to lead him out into the corridor. They arrived at the first emergency lock to the central compartment of the ship, and here met Armand Karne and those he had rescued. Apparently they were the only ones in this entire airless compartment.

The Ranger jerked the emergency lever. The outer door of the double lock obediently swung open. He beckoned the red-haired girl in. Only one at a time could stand in the tiny space. When he had swung the seal to, the girl threw the inside lever and the inner seal opened, allowing her to step into the aerated compartment beyond.

One after another, they all repeated this maneuver and finally stood together, safe from the airless hell they had vacated. They took off their tight, bruising masks thankfully, strode forward. A minute later they had joined the passengers who, under the magnetic command of Commander Jackson, were fighting the fire in the rear, carrying pails of water.

They too worked willingly to help this blazing-eyed, roaring-voiced man who had so recently been a mumbling paralytic in a wheelchair. The entire crew, with them their captain, were already donning space suits at Jackson's command, to begin a thorough survey of the ship, its total damage and casualties.

AN HOUR later no longer threatened by imminent death, the entire group of surviving humanity sent up a hearty cheer as the radio operator reported contact with Earth and the early arrival of rescue ships. Then, as one, they all turned to the white-haired Commander Jackson and made the close confines of the central compartment ring with their cheers.

Commander Alamo Jackson smiled with face uplifted, proudly, happily. For him, this hell had become his heaven. . . .

Standing to one side, the red-haired girl's father said, "You shall have all the financial help you need, young man. We're going to fight your case if it takes every penny of my fortune, and we'll prove your innocence!"

Armand Karne found himself shamelessly glad that the space ship had had this wreck. . . .

But no more so than Erlene Edgewood, whose blue eyes dropped before his gaze, lest she give herself away with unmaidenly haste. . . .

Sir Alfred Pearson laughed cheerfully when the captain, back from his survey of the ship, reported that all his belongings in his stateroom had been totally destroyed, and promised that the company would make good every penny of its value. . . .

On the captain's list of those killed, solemnly read off to the survivors, was one name among others—William Darvy. . . .

The Earth express *Starshell,* lying wrecked, and having intersected the orbits of the moon and of fate, had completed its flight.

NEXT ISSUE

MEN MUST DIE

A Novelet of the Spaceways

By WARD HAWKINS

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A FASCINATING KNOWLEDGE TEST

GET on our mental merry-go-round. If you want some scientifun, play around with this month's batch of scientifacts. Here's a cosmic collection of high-voltage brain-teasers that should generate some sparkling results. Consult page 129 for the correct answers if you're tuning in on static. Electrocute your friends with your knowledge if they don't solve these puzzles in a flash.

POSITIVE OR NEGATIVE?

The following statements are either true or false. Look before you leap. Par for this circuit—15 correct.

1. Most meteors are very small—about the size of a grain of sand.
2. One of the most remarkable properties of the human eyes is that of analyzing light.
3. The pouring of a glass of water from a pitcher would present gravitational difficulties at that point between the Earth and the moon where their attractions for the water were equal and opposite.
4. "Fireball" is a term used in astronomy to designate those meteors which are large enough to be apparently brighter than the planet Jupiter.
5. A skater on a frozen lake does not really skate on ice but on a thin film of water.
6. If we have a blue and a red star of the same magnitude, the red star will make as strong an image on a photographic plate as will the blue.
7. The discovery of a scientific principle can be patented.
8. Because there is no atmosphere on the moon there can be no seas, rivers or waters of any kind.
9. The Solar Constant is a constant expressing the amount of solar heat received by the Earth.
10. When dew forms on the windowpane of a heated house in winter, it usually forms on the outer surface of the glass.
11. The results of at least two different kinds of observation prove that the Earth's interior is largely composed of rigid matter rather than molten material.
12. Different parts of the planet Jupiter revolve at different rates.
13. The heart of a child at birth weighs less than an ounce; that of an adult, half a pound.
14. No animal is immune from normal death.
15. The tail of a comet always trails out directly behind the comet.
16. Plants, as well as animals, are attacked by a great many diseases.
17. Cosmic rays are mysterious and powerful electrically charged particles which constantly bombard the Earth.
18. Only one-fifth of the "starlight" comes from the stars.
19. The ears of insects are usually found in the thorax or abdomen.
20. The center of gravity of the Earth and the moon (i.e., the point about which they both actually revolve in their course around the sun) lies about 1,050 miles above the surface of the Earth.

TAKE A LETTER

Here are ten incomplete scientific facts. Three or more suggestions are offered as possible fill-ins for each statement, but in each case only one is correct. Can you find the needle in the haystack—without an electro-magnet? Par for this course is seven.

1. According to the latest statistics the chief cause of death is: (a) heart disease, (b) cancer, (c) pneumonia, (d) nephritis.
2. Other things being equal, perpetual snow is more likely to be found in: (a) low latitudes and low altitudes, (b) high latitudes and low altitudes, (c) low latitudes and high altitudes, (d) high latitudes and high altitudes.
3. The shortest distance between any two points on the surface of a sphere is: (a) straight line, (b) parabola, (c) great circle,

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(d) hyperbola.

4. The best definition for a "dodo" is: (a) a fabulous bird of the Arabian Nights, (b) a large clumsy flightless bird, now extinct, (c) a prehistoric bird with giant wings, (d) a person with an I.Q. of less than 50.

5. The C.G.S. System is: (a) a method of forecasting eclipses, (b) a method of physical measurements, (c) a method of classifying stars, (d) the system used by the new Contract Bridge champions.

6. The Wilson Cloud Chamber is used to: (a) predict the weather, (b) cause artificial rain, (c) study cosmic rays, (d) study extra-galactic nebulae.

7. If several gases not reacting chemically upon each other are introduced in the same container, the pressure of the resulting mixtures is equal to the sum of the pressures which would be observed if each gas were separately enclosed in that container. This is: (a) Dalton's Law, (b) Pascal's Law, (c) Cavendish's Law, (d) Torricelli's Law.

8. Both the moon and the sun cause tides upon the Earth. The ratio of the tide-raising power of the moon and the sun is as: (a) 9 to 1, (b) 5 to 11, (c) 11 to 5, (d) 1 to 9.

9. Rheumatism is a condition of inflammation which may affect nerves, muscles, or any other tissues of the human body. When it affects bones and joints the condition is called: (a) tuberculosis, (b) infantile paralysis, (c) lockjaw, (d) arthritis.

10. *Citrus Limonia* is the technical name for the: (a) biggest mountain range on the moon, (b) calcium-lime ore found only in Death Valley, (c) man-eating plant of Madagascar, (d) lemon.

SCRAMBLED LAWS

Below are some familiar scientific laws. However, our printer dropped the type and when he put the laws together again the words were in the wrong places. Can you unravel the words, place them in their correct order, and then identify the laws? Par: Unraveling, 4; identification, 3. You should get half of them right—if the Law of Averages works!

1. To stress the proportional is the strain.
2. And every reaction directed there to an action is always oppositely equal.
3. Inversely as at the constant volume of a gas pressure varies the temperature.
4. With the foci of the ellipse of every sun is an orbit at its one planet.
5. At the same temperature and the same pressure volumes contain equal molecules of all number of gases.

UP AND ATOM

This one calls for some atom-smashing. The following words, when the letters are arranged in their proper sequence, all pertain to the atom. The first one is as easy as the alpha-bet. Par for this stretch is 9, if you want to carry some atomic weight with us.

1. paahl; 2. trobi; 3. estoopi; 4. nutmauq; 5. lyecavn; 6. neotcler; 7. loupccres; 8. rosemmiis; 9. radiotain; 10. taleqvunie; 11. zinitinooa; 12. viariocitytad.

COMMON SENTENCES

What have the words or phrases listed below all in common? (Example: elephant, kangaroo, camel, bear, ape, are all *mammals.) Par:* 3.

1. The blue of the sky—the rainbow—the twinkling of stars—the redness of the sun.
2. Sinus Iridum — Aristarchus — Oceanus Procellarum—Mare Nubium.
3. Xerophthalmia — beriberi — pellagra — rickets.
4. Auricle—myocardium—endocardium—ventricle.
5. Houses are human forms—smooth walls are men—ledges and balconies are women—water is birth—journey by train is death.

WHAT'S YOUR SCIENCE I.Q.?

After you've completed the SCIENCE QUIZ, and checked your results with the correct answers, get a slide-rule and calculate your score. Here's how you rate.

49-57—A Mental Giant.
41-48—A Walking Encyclopedia.
35-40—B.B. (Bachelor of Bookworms).
30-40—Try Crossword Puzzles.
0-29—Absolute Zero.

ANOTHER SCIENCE QUIZ NEXT ISSUE

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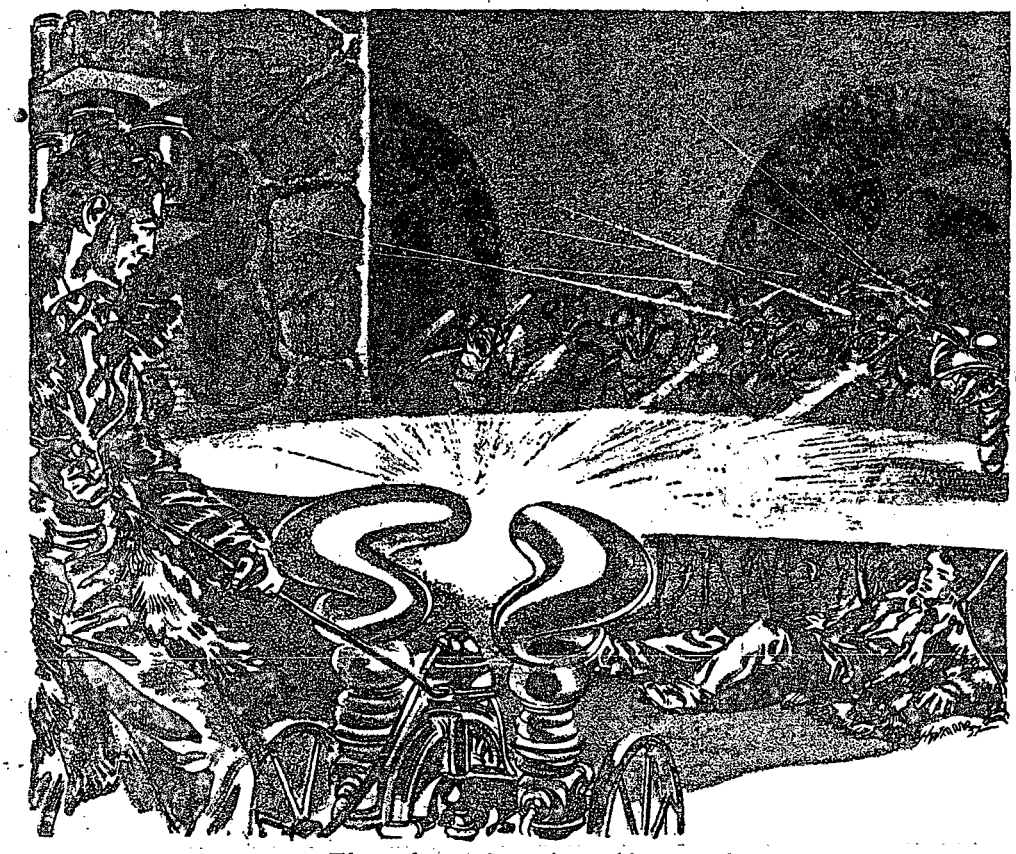
INVASION'S END



The wedge of destroying gold appeared

Eons Ago the Implacable Doom of the Ice Age Had Swept Away the Invading Martian Horde—But There Were Survivors!

By MYER KRULFELD

Author of "Altar of the Worm," "The Devil's Hospital," etc.

AT the sudden bite of Ken Flagg's fingers into his shoulder Bill Howarth turned inquiringly from the controls of the plane. His blue eyes narrowed at the tensity of Flagg's thin, tanned face, at the quivering of his finger as he pointed toward the northern horizon.

Howarth was one of the pilots and a junior physicist of the Kimball Antarctic Expedition. Flagg was second in command of the expedition and in command of this present flight of exploration.

For two hours they had been winging their way over country never before viewed by men. They were far west of Marie Byrd Land and the Edsel Ford Range. The land beneath them was a cold white bleakness, flat, unvarying, silent.

Following Flagg's pointing finger,

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Howarth shot suddenly erect in his seat. Flame! A red flame glowing like a point of blood on the white purity of the Antarctic horizon! For a second he suspected it might be a trick of the wan, continuous sunlight, a reflection from the red ball which leered down at them. But this flame was strangely regular, like a candle flame, the shape of a red lens seen sideward.

Flagg shouted an order and they hurtled toward the flame. Rapidly it grew larger, gigantic, stabbing up to the cobalt blue of the sky. And then, even as they looked, it winked out.

A sudden startled oath came from Howarth. They were directly over the place of the flame, and it was a vast white bowl set in the Antarctic ice, miles wide. Exactly in the middle and at the bottom of that bowl was a dark circle, an opening! And suddenly as a stab in the dark, from that opening a shimmering beam leaped upward, pale violet, thin as a pencil!

It touched the plane. There was a strange whirring, a sputter. And the next second the plane's motor was dead. Down they went in a steep spiral.

"Start her!" Flagg yelled.

Howarth worked desperately, and in vain. The strange bowl in the waste leaped toward them. Nearer—faster!

Powdery snow erupted into the air as they struck. The skis of the plane plowed deep. The tail lifted, hurtled over the nose. A cracking, the groan of wood and metal, and then the plane lay still on her back, buried in snow. . . .

HOWARTH did not know how much longer it was before his eyes opened. He ached. Everything reeled in dizzy circles. Cautiously he moved, muscle by muscle. It was agony, but nothing was broken. He was simply bruised from heels to aching, torn scalp beneath his shock of yellow hair. He set his teeth and managed to get to his hands and knees in the mangled, wreckage-strewn cabin.

A dark huddle lay beside him. He crept to it. A low moan was coming from Flagg's white lips. A crimson rivulet ran from a gash in his forehead.

"My damned leg," he whispered. "Broken clean." The leg was twisted, unnatural.

"Can you move?" Howarth asked.

"I'm going to whether I can or not!" Flagg said, teeth setting.

Five minutes later they were outside the plane. Cold sweat stood out on Flagg's yellow features. Little drops of blood oozed from his lips where his teeth had bitten deep.

But neither he nor Howarth was thinking of that. For coming toward them were alien things, seven of them, and already they had struggled through the dry and powdery snow halfway to the two men and the wreckage of the plane.

Black against the whiteness, they looked like ants, with a similar structure of head, thorax, and abdomen. But instead of scuttling, they stood upright on four spiderlike legs, bodies swaying. Two long tendrils grew from the heads, long, thin, and wiry, with the flexibility of tenacles and the delicate control of human hands. Each one of the bizarre and sinister creatures was the size of a small man. A low, constantly changing hum which evidently served them for speech came from the group.

Howarth's glance shifted to the lip of the bowl, white and sharp and far above them.

"Listen!" he said tensely to Flagg. "We can't run away from them. But this bowl is steep. If we rolled, we'd go fast. There's just a chance that we'd dodge that bunch and get to the mouth of the pit."

Flagg nodded. Howarth drew a deep breath, doubled up, and hurtled down the curving steep side of the bowl. Flagg followed, a g r o a n wrenched from him by his leg. The humming speech of the insect folk burst into an incoherent broken gabble.

As they slid away the metallic instruments of the insects flashed again and again. Red rays hissed. Plumes of white steam rose as the red stabs bit hot into the snow. There came the stench of burned fur as one of the rays

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touched Howarth's fur parka. A choked cry came from Flagg as one ray went home.

Then they were beyond the range of the rays and flashing toward the black pit at the bowl's bottom, the bite of cold, hard particles slicing into flesh. Then suddenly blackness as they hurtled through empty air; and finally struck ground.

They were within a black pit. It proved to be a miniature of the great bowl of whiteness outside, studded with slanting tunnels.

A quick glance showed Howarth that none of the insects were on guard. They had all rushed to the plane, leaving the entrances unguarded.

He staggered to the inert huddle which was Flagg. Stertorous breathing came from the flight commander, his eyes were closed and he lay very still.

SWEARING between clenched teeth Howarth lifted Flagg to his shoulders and stumbled down one of the slanting black tunnels. Faintly behind him he could hear the sinister hum of the returning insect guards. Ahead of him was only darkness and silence.

Soon a faint radiance showed on the walls in irregular streaks. Luminous stuff, like a chemical paint. He paid tribute to the science of the insects. He could see his path now.

The tunnel led on interminably. The burden on his shoulders seemed to grow heavier with each passing second as he strained his ears for sounds of pursuit. But he caught no sound of the insect hum.

He tried to hurry, his heart pounding, laboring. He turned a curve in the tunnel and stopped. The tunnel had ended and he was in a great chamber, faintly lit. As he hesitated there came a sudden hissing from behind him. An unbearable pain tore at his shoulder. He dropped to the floor, twisting even as he fell.

One of the insects *had* followed him. The red ray of the strange missile sought to stab heat, death into him.

At its touch he rolled in convulsions. The ray burned into his hand, singed off a lock of hair, seared a line into his cheek. But moving as fast as he was it could not fasten into him and kill him.

The insect had neared him—was only a few feet away. With a savage lunge he was hurtling at it. For one split second the ray met him full in the shoulder. A scream of agony shuddered from his writhing lips. Then he crashed into the insect.

The thing tottered a moment. Then it and Howarth fell together. The man's hands shot out, tore at the feeler which wielded the still hissing red ray. It was tough. He pulled desperately. A shrill hum of agony came from the writhing insect as the feeler tore loose, twisting like a headless snake.

Hard, glittering mandibles sought for a grip on him. The remaining feeler lashed down like a whip. The thin, stalklike, powerful legs of the insect thing caught at him. A sickening foul stench came from it.

Jaw set, Howarth's hooked hands clawed ineffectually, scraping over the smooth, hard, chitinous armor of the insect. He pounded. Blood streamed from his raw knuckles.

The flailing tentacle wound around his throat, tightened. Weakness began to sap the strength from his muscles. His hands found the thin joint which connected the head and thorax of the insect. They closed around it desperately, tightened. Reluctantly it gave under the pressure. A fierce surge of energy went through Bill Howarth like a sudden spasm. He tore!

A high, whining scream that died. The joint gave in his hand, broke. Liquid welled from it. Stringlike masses of nerves were like soft pulp in his fingers. But he was free. Supine upon the floor of the tunnels, he stared with hard eyes upon the writhing, headless body and the twitching head.

GULPING in breaths of air, Howarth crawled to the still unconscious Flagg. Fighting his way to his feet, he dragged Flagg to his shoulder. He went on—into the chamber

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beyond. It was big and silent and empty. Other tunnels led off from it, all slanting lower. He chose one at random and staggered on.

He was heading along the tunnels, to where he did not know, when Flagg stirred. Lowering his burden to the floor he stood swaying over the pilot. Slowly consciousness returned to Flagg. He stared stupidly. "Where are we?" he mumbled. "What happened?"

"We're in the nest of the insects," Howarth said lightly, and swayed forward to the floor. But the next minute he struggled up, dragged forward, with Flagg crawling painfully beside him. The only thought in the mind of either was that they had to keep on.

Suddenly they stooped, looked at each other with glazed eyes. An indefinable, sour, warm smell that clung unpleasantly to their nostrils was coming from in front, the smell of the insects, magnified! They must be stumbling onto an inhabited portion of the warren!

"I can't make it with my broken leg," Flagg whispered hoarsely. "Go ahead, Bill. You've got a chance."

Stubbornly Howarth shook his head.

Flagg glared. "You fool! Think it will make it any better for me to feel it's my fault you're caught? You've got a fighting chance—take it!"

Howarth's lips set. "We'll go through this together, whatever happens," he said firmly.

Gradually Flagg's glare turned to a slow smile. "Well, what are we going to do? Walk right into a nest of those devils?"

"We'll take one of these side passages," Howarth said, realizing that in the emergency some of his fatigue seemed to be leaving him. "We can tell by the smell when we're coming to an inhabited spot. If some of them stumble on us or manage to trail us faster than we can get ahead of them—" He shrugged his shoulders expressively.

As they went on Flagg's crawling progress became slower and slower. But he was still with Howarth when they finally came to a place which seemed deserted. Many times they had heard the slight whisper of scurrying insect feet on the smooth surface of the tunnel floors, just in time to escape undetected up a side passage.

Here, however, they seemed temporarily safe, in a spot where Howarth could fight off his weariness and the ache of his bruised body. But Flagg's leg was swollen, his face grey with pain. He stared morosely at the floor, playing absently with a small pencil stub he took from a pocket.

"Bill," he said suddenly. "Look—I just found this on the floor. It may explain something."

Howarth bent over to study the object. And at that moment Flagg's other arm swept up, came down. Something hard hit Howarth behind one ear. Everything went black. . . .

HOWARTH did not know how long it was before he came to, sick and dizzy. Flagg was gone. And on the floor a tattered scrap of white paper caught his eye. A few words were scrawled on it.

Bill: With me holding you back, you were sure to be trapped by the insects sooner or later. There'd be no sense in it. I took the only way I could see. I've left everything I thought you might be able to use.

Howarth looked at the little pile of miscellaneous objects on the floor. There was a jackknife, a pencil stub, a short length of pipe, two hand-rolled cigarettes, a small square of chocolate, partly melted and misshapen. Tears suddenly stung his eyes.

No use staying here, however. He went on. Gradually the passages became dimmer. Evidently this part of the insect warren was rarely used. It seemed to be getting colder, as though he were traveling away from some source of heat.

When he stopped at last it was in sheer stupefaction. He faced an old fresco on the wall, faded, flakes of it gone. It depicted a dancing girl, the lines stilted and formal along the sway of her limbs, the bend of her torso, the roundness of her breasts, the lovely still oval of her face. But no insect could have painted it so discreetly and humanly wanton. Human be-

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ings had once been in this place!

Curiously, the shock brought him out of his half daze, made him realize anew how infinitely weary he was. Here, he thought possibly the insect folk would not think of searching for him, for a time at least. He stretched out beneath the faded image of ancient loveliness in that dim and lonely place and dropped into dreamless, heavy sleep.

When he awoke he felt alive again, though his body still ached and his pain-stiffened muscles were an agony. But his brain was clear. That sickening fear and frustration were gone.

Curiosity as to the human beings who had once been here burned in him. Was it possible that this once had been a human settlement? Was there other means of escape from the bowl beside the pit by which he and Flagg had entered? Were food or clothing to be found anywhere near?

Determinedly he strode through the dim corridors, eyes watchful for any new opening, any more frescoes, anything which might offer a clue.

And suddenly he came upon a solitary skull resting quietly in the angle between wall and floor; a skeleton a little farther on. There was a charred streak on one of the breast bones, like that of an old burn. He remembered the burning pain made by the red ray of the insects and hurried on, his eyes hard and glinting like ice.

More and more remnants of human folk met his eyes as he advanced—indications of their work, and their broken bodies, reduced now to bones. Yet nowhere was there anything to tell him where human beings or insects had come from, whether they had come together or not, and what had caused the destruction of the humans. Grinning skulls told no tales.

He came at last to a huge chamber, with a high-arched roof. It was like a vast amphitheater, covered over. And over every foot of it were broken skeletons.

WITH sick awe he regarded the vast charnel house. Even in the dim light he could see that at one spot was a greater collection of bones than at any other. He investigated. But the heap of bones seemed piled haphazardly at the whim of chance against the wall, that was all.

He leaned against the wall as a wave of nausea swept over him. There was a faint click, a swishing sound. A section of the wall swung back. He fell into a hidden room.

He stared with astonished eyes. Everywhere there was a film of dust, but the small cubicle was undamaged. It was a laboratory, and evidently had never been found by the insects.

Shelves on one side were jammed with glass jars which held food, some strange and some familiar. Others were filled with water. The other three sides of the room were also shelved and contained chemical and electrical equipment of almost every description.

In the center of the chamber was a table on which lay a maze of tubes and coils. And before the table lay a crumbled skeleton. Every bone was intact, and Howard knew that here the man had died, his body never touched thereafter.

His gaze went again to the instruments. Apparently the man had been working on some weapon.

Swinging the section of wall back into place behind him he strode to the table, his eyes striving to analyze the nature of the jumble. Electro-magnets were coiled into humped ovals and circles like overgrown and misshapen doughnuts. Here were contact points, here two great tubes perculiarly shaped, and filled with a strange, dull green gas. There were controls and, lying open, filmed with a grey coating of dust, was a notebook.

Howarth dusted it off and looked at the metallic silvery pages, covered with diagrams and script in rusty red.

The last page was a laborious, uneven scrawl, suggestive of weakness and haste. It consisted of seven ovals, each surrounding a round disc in the center. Between the third and the fourth ovals were two short connecting arcs.

Staring at it with puzzled eyes, Howarth nodded suddenly, with tightening lips. It was a sketch of the

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Solar System as known to the ancients, with the ovals representing the orbits of planets. The third and fourth orbits were those of Earth and Mars. The short curves connecting them meant that something had passed from one planet to the other—the insects!

He turned back a page. There was the sketch of a continent with a dot marking a spot on it. It seemed strangely familiar, and after a time he recognized it. Antarctica—but an old Antarctica, in the days when it was a temperate, flourishing land. The dot represented roughly the position of the white bowl over the insect nest.

His glance went to two letters written beneath the map. Distorted, ancient, and changed, yet he recognized them. An M and a U! MU! Antarctica had been the legendary Mu! And this charnel house contained the last remnants of the Murians.

Slowly he pieced the story together in his mind. Mu covered by an advancing wave of ice, fighting desperately for existence; some Murians fleeing to other continents, some remaining, stubbornly contesting every inch swallowed by glaciers; and then, fleeing from their own dying planet, the Martian insects had invaded Mu. There had been battles. Desperate battles.

SLOWLY the Murians had been driven back, broken and destroyed. Here had been their last stand. The insects had remained, to die slowly under the cold doom of the glaciers. They, too, were now making their last stand against the icy continent which was destroying them.

Howarth turned page after page, but could find nothing more he could read. The few other diagrams were meaningless to him. He put the notebook aside and turned to the instruments on the table. Most of the controls were strangely designed, but their purpose was clear. One was a master switch.

He jerked it down into position. There was a dull humming, and from the two green tubes burst two hemispheres of dull violet, fading out about four feet away from their source. The pungent odor of ozone filled the air.

He yanked the switch back. The smell of ozone lingered. The green gas within the tubes swirled sluggishly.

He thought he recognized the rays—cathode rays, streams of electrons blasting out at terrific velocities, with unparalleled power. He believed he could see what the ancient Murian had been trying to accomplish when he died. Sprayed out, these cathode rays were harmless beyond a range of a few feet. But concentrated into a thin beam, they would blast through almost anything, ripping atoms apart as they bored through. No living organism, human or insect, could stand such a withering fire.

Hastily Howarth adjusted the metallic reflectors which lay around the tubes. They turned red hot, then white hot as the rays bombarded them, then became pitted, rough and useless. He tested them all, but none could stand up. And for the few moments that they worked they merely tripled the range of the rays, which was not enough. The range of the weapons of the insects was far greater.

He tested the electromagnets, one by one. The electrons were deflected, but not enough. The vicious speeds of the electrons gave them an inertia too great for the electromagnets to overcome.

Howarth felt a mad desire to rip at the tubes, to smash them to powder. Curses ripped from his lips. Here was potential salvation. And he could do nothing with it!

Shaking with anger he turned from the table, went to the jar of food and water, smashed them against the outjutting shelves, raggedly taking the tops off. Ravenously he went at the food.

Then he turned to the apparatus on the shelves. One by one he regarded each item, hope slowly dying. Chemicals, coils, condensers. He could see no use for any of them. He came at last to other tubes like the ones with which he had been working, but instead of a green gas, they were filled with a curious dead blackness.

His breath escaped in a sudden sigh.

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Could it be possible that these tubes produced alpha rays—streams of protons?

His eyes lighted, considering that possibility. Protons and electrons hurled at each other might coalesce into ordinary forms of matter. They would liberate terrific energies in the process. And their speed, their inertia, what would it—

At last he had the tubes connected, one green and one black, so set that their rays would converge. A prayer on his lips, he pulled down the switch.

A ROAR filled the laboratory. Howarth flung up an arm to protect his eyes. The two hemispheres emitted by the tubes, violet by the cathode ray tube, a faint red by the other, met in a blinding flash of flame and heat. And from the plane where they met a fan-shaped sheet of shimmering, hissing gold leaped into space. It was inconceivably thin, sharper than a blade. It met the wall, blasted through it in a thin, vertical line.

Howarth groped his way back to the table, his blood singing a song of triumph through his veins. He found the switch and pulled it up.

The roaring died. The flame and the heat were gone. But in the wall where that golden plane of energy had struck was a thin line of destruction. . . .

Bill Howarth had known that the insects would track him down sooner or later. But when he finally heard their humming, muffled by the wall which concealed him, he was ready for them. The two tubes were in place, braced in a framework of metal, the whole set on two wheels. Long, flexible cables led to his power supply, so his machine had a certain mobility. It was set so he could tilt it up or down by means of a long rod.

Hard-eyed, he waited. The humming became louder. The insects on his trail must all be within the great outer chamber now. He flung the section of wall back with a snap, shoved his weapon forward.

About twenty of the insects were there, upright dark slugs moving about. But with them was Flagg, his arms constrained, slung between two of them.

Howarth paused tautly while the humming of the insects rose to a triumphant crescendo. He saw feelers whipping forward, saw metallic weapons straighten, point at him. Two stabs of red shot a scarlet glow upon the wall behind him.

He flashed into action. He lifted the handle which controlled his ray machine, depressing the angle of it. The switch snicked into place.

Again that roaring, again a shimmering sheet of hot energy flared fanwise from the two glowing tubes, sliced into the advancing insects—*below* Flagg's dangling form!

The next instant the wedge of destroying gold was gone. Half of the insects lay upon the floor. But the others remained upright, even some with parts of their bodies gone!

Flagg was an inert heap on the floor. Howarth shifted the angle of the tubes and pulled the switch again. The sheet of gold roared outward. The upper portions of the insects sagged above the golden shimmer.

The feeler of a disintegrating insect whipped desperately out at him. A flare of red pinned him. Pain bored in, burned through his flesh, ran in liquid agony through his veins. He reeled back, sickness wrenching at his vitals, blackness whipping around him. . . .

When he came to again the tubes of the machine were dead and still. The only sound was the harsh breathing of Flagg, hunched above him. Flagg's face was yellow and shrunken like a dried fruit. When he spoke, each syllable was a painful thrust through twitching lips.

"Bill—how did you—do it?"

Howarth pulled himself up. His voice shook.

"Flagg, what's happened? What did they do to you?"

FLAGG stared at him dully. "Me? Nothing—it doesn't matter."

"What kind of a place have they got, Flagg?" Howarth asked sharply. "Have you learned anything?"

"I've learned there aren't many of

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them," Flagg said dully, "and this colony is simply a maze of caves, huddling around the hot core of a volcano. They get their heat and energy from it. Every once in a while gases accumulate which they have to blast out. That was the red glare we saw."

"A live volcano!"

Howarth's lips thinned to a taut line. He sprang to the controls of his machine, pulled the switch.

The intolerable golden shimmer of that sheet of energy ripped into the walls. Slowly Howarth rocked the machine while the hot thin glare ate the wall away.

Suddenly the spot where the energy bit deep gave way to white and a streak of blue. Howarth reversed the machine. The golden plane of energy bit into the other wall, in the direction of the volcano's hot core!

Dragging Flagg after him he made his way toward the distant blue and white fleck of sky, along the hot path blasted by the roaring energy machine. Part of the time he carried Flagg. Part of the time they crawled, and behind them was the roar, growing fainter as the golden plane bit relentlessly into the cold earth, seeking the volcano's hot core.

They had made fair distance, crawling, wheezing, gasping, when suddenly Flagg collapsed. Howarth shook him, slapped him, tried to drag him. But the man's dead weight was too much. Helplessly he stared at the white and blue opening, so near now that a cold breath of air from the snowy landscape touched his face.

And at that instant there came the shrill humming of an insect from behind him! Somehow he managed to get to his knees. But no more. He swayed helplessly.

The hum grew louder. The insect was close now, scuttling swiftly up to him. The smell of it assailed his nostrils. Then, hard and viciously, the insect crashed against him, feelers twining around his throat, mandibles clamping on one shoulder.

The pain shocked a little life into Bill Howarth. He struggled to his feet, his hands clawing blindly for the pipelike connection between the head and thorax of the insect. He clung to it, but despite his utmost efforts the thing was slowly and painfully draining away his life.

He could feel the bite of the mandibles going deeper, feel the last breath of air dying in his lungs. But suddenly, even as everything seemed finished, a roar shattered the air, picked him and the insect up like scraps of paper blown by a wind and whirled them through the air. A red glare split the dimness of the tunnel and obscured the white light of day outside. A blast of heat like a flame's red tongue lapped against his flesh. He was whirling, hurtling, flying into darkness. . . .

WHEN Howarth came to he seemed to be freezing and roasting at the same time. After the first wave of nausea passed, he stirred, felt a stab of pain in his chest. A broken rib.

Below, flames rose from the white bowl, on the side of which the explosion of the released volcano had flung him. Steam was melting snow around him.

Near the pit the snow was gone, the ground black and bare.

The black form of the insect lay very still, grotesquely twisted. Further away was another dark form—Flagg. He tried to reach him, couldn't.

But he saw him stir a little. Flagg was still living.

A sudden drone above him jerked up his head. Incredulously he stared at the dark outline of a plane swiftly coming nearer.

Of course, he thought dully, they'd look for us when we didn't get back. He stared again at the red mouth of the unleashed volcano. A strange contentment filled him. No more insects. The Murians had been avenged.

The plane circled to a landing and two dark figures in furs came running toward him. Their voices reached him.

"Bill! Are you all right?"

"Okay!" he called. His voice was a thin pipe. He tried to wave an arm, fell back, swearing under his breath.

That damned rib hurt!

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The TELEPATHIC

A Complete Novelet of Secret Forces

Fingers shaking, he pulled the switch

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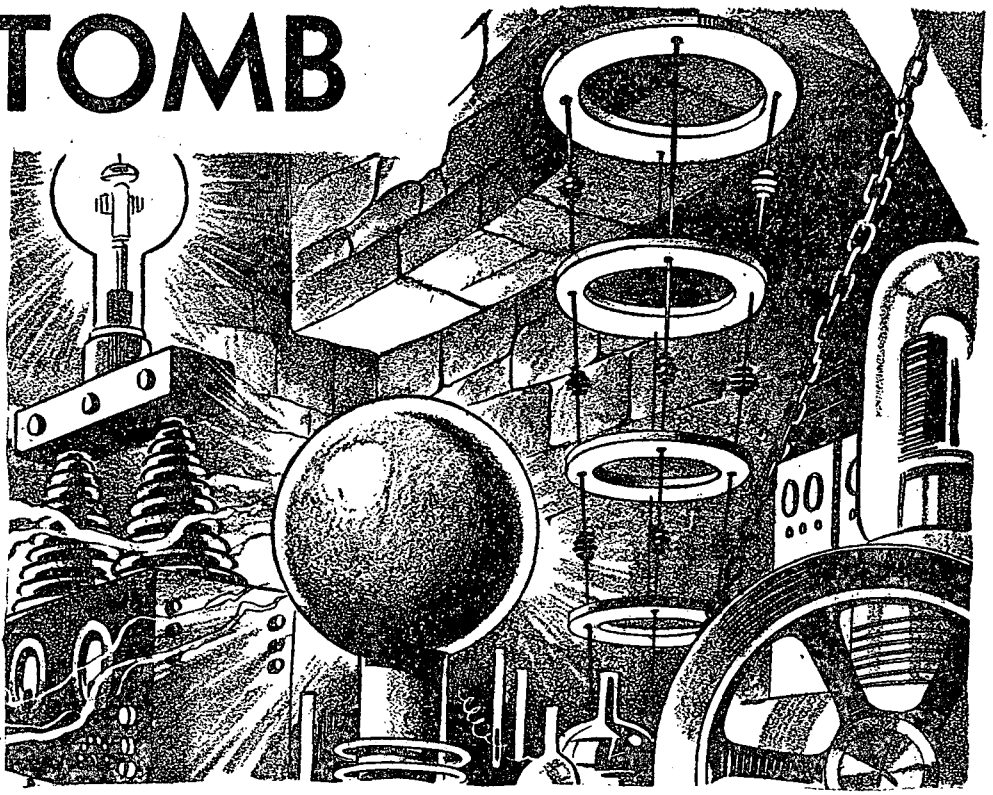
TOMB



For Three Hundred Years the Body Remained in a State of Suspended Animation, Protected by a Wall of Electronic Matter—Stranded in Absolute Time!

By FREDERIC ARNOLD KUMMER, JR.

Author of "The Exterminators," "Death at Eight Bells," etc.

CHAPTER I

The Time Captive

A WILD and raging storm tore at the tiny island, lashing it with indescribable fury. Lake Michigan, normally so blue and sparkling, was a hell of leaping, tumultuous waves, whitecaps that broke in clouds of spray over the dark, igneous rocks.

The islet's single habitation, a large stone farmhouse of archaic twentieth-century design, reared its massive bulk against the ominous, blue-black sky. Gnarled, wind-whipped trees, twisted and maimed like cripples, beat with leafy fingers upon the grimy, dust-blurred windows of the ancient dwelling. Only the trim little rocket-plane, sleek and gleaming upon the weed-grown lawn, afforded a modern, up-to-date note.

Inside the farmhouse four men huddled about a portable radium lamp, eyeing with evident curiosity the dust-covered bookcases, the old wooden furniture, the rotting velvet draperies.

"Well," Bronson, the black-bearded physicist, glanced disgustedly about, "a charming spot, I must say! Now that we're here, Vettner, perhaps you'll be good enough to explain what this is all about!"

Professor Vettner, slim, fragile, white-haired, shook his head.

"There are ten more minutes to go," he announced, glancing at his watch.

"Ten more minutes!" Dr. Frome, head chemist of International Rocketry,

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waved a fat and pompous hand. "Sheer dramatics, eh, Cross?"

John Cross, the bronzed young physician, shrugged.

"As scientists you must realize that there are reasons for everything," he murmured. "My curiosity will hold out another ten minutes!"

"Thank you, Cross." Professor Vettner inclined his head. "I admit, gentlemen, that for me to bring three of the leaders in their various fields of science to this barren island—to bring them here without a word of explanation—is something of an imposition. In deference to my position as director of the National Research Foundation you have accompanied me, and I do not feel that you will be disappointed."

"Can't you give us a clue?" Frome grunted. "So that when the great moment arrives"—his voice was tinged with sarcasm—"we will be prepared?"

PROFESSOR VETTNER drew from his pocket an envelope, yellowed and cracked with age.

"We are here to carry out a trust placed in the hands of the National Foundation three hundred years ago this night. Do any of you recall the name of Alexis Coar?"

"Coar?" Bronson repeated, tugging at his beard. "Not the man who claimed to have discovered electronic matter?"

Vettner nodded, slowly.

"Hmm." John Cross toyed with the catch of his medicine kit. "They say he went mad because no one would believe him."

Again Vettner nodded.

"On the twenty-first of November, 1940, Coar appeared at the Foundation's administration building, greatly agitated, but apparently in full possession of his faculties, and presented the executive committee with this envelope. I was, he explained, to be opened in the library of his house at nine o'clock on the evening of November twentieth, 2240. He furthermore gave the committee the deed to this little island on the condition that no human set foot upon it for three hundred years. To cover expenses he placed a large sum of money in trust, the interest on which they were to draw for taxes, maintenance, etc.

"Six months later Coar was found walking the streets of Chicago, mumbling incoherently about 'murder' and 'living death'. Stark mad. He fancied he had committed some horrible crime and he died without recovering his reason. The Foundation has lived up to its agreement with Coar implicitly. The money in trust has enabled us to keep an observation boat anchored off shore to see that no one landed upon the Island. We, tonight, are the first to enter this house in three hundred years!"

As Vettner concluded, a hush fell over the cobwebbed room. Outside, the storm seemed to redouble its intensity. Rain, intermixed with hail, slashed at the rattling windows; the wind howled like a pack of furious werwolves, buffeting the house until it groaned for mercy. Vettner, staring at his watch, seemed gripped by the air of menace, of foreboding, that permeated the old building. Suddenly he straightened up, snapped the watch shut.

"Nine o'clock," he announced solemnly.

Then, with trembling fingers, he ripped open the envelope. The three men leaned forward eagerly, their eyes upon Vettner's thin, ascetic face.

"To the scientists of the future," he read. "I leave you a great invention made possible only by a great crime. May God forgive me, since my daughter Anna separated forever from the man she loved, could not. Believe me when I say all I have done has been in the name of science. To reach my laboratory, press the nail upon which the picture of Anna hangs. There you may witness my work, judge me accordingly. Alexis Coar."

"Huh!" Frome snorted. "The ravings of a maniac! I'm—"

"Always the skeptic, Frome!" John Cross chuckled. "I suspect that's what makes you such an excellent chemist!"

BRONSON'S gaze swept the library. Five of the paintings upon its walls were recognizable as landscapes. The sixth, a portrait of a young, dark-haired girl, must necessarily have been the picture of Anna Coar. Smiling

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a trifle doubtfully, Bronson lifted it from the wall, tugged at the nail.

The creaking of rusty hinges was audible above the roar of the storm. Slowly a section of the panelled wall swung inward, revealing a dark passageway.

"Ah!" Vettner seized the heavy radium lamp, sprang toward the opening. "Do you still doubt, Frome?"

"A tunnel is hardly a scientific achievement," the fat man wheezed. "Wait'll we see what's at the other end of it!"

Nodding in agreement Bronson followed him into the passage. John Cross, gripping his satchel, was the last to enter; his imperturbable calm seemed in no way shaken.

The corridor ahead of them ended abruptly in a flight of stone steps. The four men descended slowly, interminably. The walls, roughly hewn from the living rock, were beaded with sweat; the savage thunder of the surf seemed above them, now, very faint in these dank, subterranean depths. A full fifteen minutes passed before the rusty iron door loomed ahead.

"The entrance to Coar's laboratory!" Vettner exclaimed in a voice that shook with suppressed excitement.

"About time," Cross grinned. "I was beginning to wonder if—" He broke off, gasping as Vettner pushed open the door.

Through the entrance shone a brilliant light, streaming like a sunburst into the corridor. The lavatory was large, filled with queer apparatus, banks of silver tubes, networks of wire, dust-covered machinery. None of these things, however, were responsible for the look of amazement that lay upon the faces of the four men. They were staring at the girl.

She was lying upon a table of black stone, at each end of which was a glittering copper helix, miraculously free from dust or corrosion. And about the girl was a shimmering, faintly transparent, golden cloud, a cocoon of radiant energy!

"Coar's daughter!" Vettner whispered, stepping into the laboratory. "After three hundred years!"

With awe amounting almost to reverence, the four men grouped about the black table. The close-up of the girl was even more startling. Her old-fashioned garments clung loosely to her splendid body; her dark hair seemed to float in the golden cloud. It was her face, however, that gripped the scientists. Her mouth was open in a soundless scream of horror, and her eyes wide with fright, and brow wrinkled in an expression of unbelievable despair. Cross, reaching out to touch her, found his hand checked by an invisible barrier.

"God!" Frome wiped sweat from his triple chins. "What—what is it?"

"Some strange form of embalming," Bronson muttered. "I . . . look here!"

FROM a near-by workbench he snatched up a thin sheet of metal covered with neatly-engraved writing.

"A message!" Vettner bent over the strip of metal, began to read aloud.

> You see before you my daughter Anna, whom you have doubtless recognized from the portrait in the library. She is the subject of my great experiment. That I would infinitely have preferred using some other person, is hardly necessary for me to explain; yet everyone whom I approached, offered large sums to, laughed, thinking me mad.
>
> Perhaps I *was* insane to have done this. Yet I had little time, with my brain tumor growing worse with each day, and I knew that unless I acted at once, I might be prevented from doing so forever. Alone here with only my daughter Anna, I resolved to sacrifice her to the future of science. Calling her down to this laboratory, I asked her if she would consent to the experiment.
>
> She spoke to me softly, as one trying to reason with a maniac, said that eternal separation from her fiancé, Ralph Hinton, was too much for me to ask. Her words, placing her lover above scientific progress, above me, her father, filled my brain with sudden, unreasoning rage. Throwing her upon the table, I turned the switch. Mad with fright, she screamed for Ralph, but the words died on her lips as the cloud enveloped her. The terrible crime was committed.
>
> Full record of these experiments will be found in my laboratory notebook. Let me say briefly, however, that the golden cloud is electronic matter, that is, a halfway state between the pure energy of the photon and the material matter of such things as stone or iron. It creates an impervious shield about

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her through which no bacteria, no form of life—not even such intangible things as rays or vibrations—can pass.

Even light rays cannot penetrate it; the image of her that you see is merely a reflection upon the cloud of semi-matter. Tidal machines on the shore of this island supply the small amount of current required to replenish the shield.

In your advanced age, you are doubtless familiar with the postulate that time is dependent upon matter, or, more exactly, time is dependent upon motion and motion is impossible without matter. Thus if the Universe were an absolute vacuity, time would be absolute. For three hundred years my daughter has been in absolute time, protected by a wall of electronic matter. Free from our relative time, she is in a state of stasis.

The moment of horror she felt three centuries ago has remained unchanged. To her, not the slightest fraction of a second has passed. Though her fiancé and her friends have long since been dust and I will continue exactly where she left off when I turned on the power that night of November twenty-first, nineteen hundred and forty. You have but to pull the black-handled switch beside the right-hand helix. I beseech you to treat my poor child with every care.

Alexis Coar.

As Vettner finished reading, his companions remained for a long moment breathless.

"Alive!" Bronson muttered, pulling at his beard. "But how could she be after so many years?"

"Years for us," Vettner said quietly, "yet not even an instant for her, immured in absolute time!" He moved nearer the switch. "Should—should we bring her back?"

"Wait." John Cross took off his coat, opened his medical bag. "She may require attention. The shock of transition, you know."

SILENTLY Vettner's eyes queried the other two men. They nodded eagerly. Fingers shaking, he pulled the copper switch.

With a sharp crackling sound, an arc of blue flame leaped between the two helixes. Pungent smells of ozone filled the room. All at once the golden cloud vanished. As it did so, the four men staggered as though under an impact of some violent, explosive force. A furious gust of surging energy buffeted their brains, numbing them into momentary unconsciousness.

John Cross shook his head dazedly, watched Anna Coar sit up on the stone table. Her eyes were wild, her cheeks flushed a hectic red. Garbled unintelligible words formed on her lips. Ralph — death — eternity. Dangerous nervous reactions, Cross realized. She seemed on the verge of collapse. Snatching a hypodermic from his bag, he sprang forward, plunged it into her arm. A gurgling scream issued from her throat and she fell back upon the table in a deep, peaceful sleep.

"Whew!" Frome caressed the top of his bald head. "I feel as though someone had clubbed me! My head!"

"Some strange force released when the cloud was dissipated," Vettner's voice was shakey but his deep eyes shone with triumph. "Old Coar wasn't as mad as we thought! Imagine what this will mean to science." He turned to Cross, holding the girl's wrist. "How is she?"

"Pulse normal," Cross nodded. "That hypo held two c. c.'s of liquid thorene. She'll sleep eight hours. The shock of her father forcing her upon that table, the dazzling light, and then, what seemed like an instant later, seeing the room full of strange men, had her nerves on edge. She'll do now, I think. I'd like some dinitroixol, though. And food to give her when she awakens. . ."

"I'll run over to Chicago and get some." Vettner moved toward the door. "You others will want to examine Coar's equipment, his laboratory records. I'll be back in an hour or so." Rubbing his hands in glee, he started up the rocky steps. "What a sensation this will make! A triumph for the Foundation!"

CHAPTER II

Strange Exits

THE Sports Center was crowded to the rafters. Ninety thousand frenzied fight fans were howling themselves hoarse, pounding one another excitedly upon the back. Countless cigarettes glowed like fireflies in the shadowy

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darkness; waves of blue smoke billowed across the hall, swirled into the cone of light that flooded the ring.

Joe Hansen, slim blond challenger was exhibiting his skill at the expense of Spud McTeague, the squat, gorilla-like champion. Time after time McTeague's wild rushes were evaded, his sweeping haymakers sidestepped. And always Hansen's glove would flick out to cut and bruise the champ's battered face. He was growing more confident now, striking with more deliberation as McTeague swayed from exhaustion.

Suddenly Hansen stepped in with a jolting left hook, and the crowd roared. McTeague hung on, desperately. The referee stepped forward to separate them. As he did so, a blank expression fell over Hansen's face. His arms dropped to his sides, his eyes grew dull. Stepping stiffly over the ropes, he commenced to walk up the aisle toward the north entrance, a pale-faced automaton.

His handlers trying to hold him, were shaken off; the crowd, expressing vociferous amazement and contempt, booed lustily. In the ring the bewildered referee lifted the hand of the equally bewildered McTeague. Fans all over the country, staring wide-eyed at their audiovisor screens, waited breathlessly for an explanation from the dazed commentator.

So intense was the excitement that only a few persons noticed the half dozen men who, at the same moment as Hansen, had started to walk woodenly toward the north entrance. A near riot was gripping the hall when the police arrived. . . .

Some fifteen hundred miles west of the Sports Center, on the green slopes of California, the sun was just setting, a fiery red ball, transforming the smooth Pacific into a sea of blood. Overlooking the ocean, a huge white stucco building, the factory of Banning Rocket-Ships Incorporated, seethed with violent activity. Crowds of gray-overalled workers, wild with mob anger, milled about the administration building, shaking their fists, shouting hoarse threats.

In his oak-paneled office Richard Banning could make out occasional words. "Wages!" "Hours!" "Strike!" The frown on Banning's heavy face deepened; he chewed savagely at his cigar. Suddenly a pale, frightend secretary sidled into the room.

"They're — they're threatening violence, Mr. Banning," he said in a shaky voice. "If we don't meet their demands, Retzsky may order them to destroy the factory. I can't understand why the governor won't send the militia!—"

"Huh!" Banning glanced contemptuously at the man. "I'll talk to 'em!"

SETTING his jaw firmly, he strode into the hall, pulled open the main doors of the building. A sudden hush fell over the crowd of strikers as the company's president appeared. Retzsky, the thin, blackhaired leader, wormed his way forward to the foot of the steps, stared truculently at Banning.

"Men!" The president's deep voice echoed across the courtyard. "You've got good jobs here, and pay equal to other rocket workers. Go back to your shops and you'll be treated as before. I'm willing to forget this whole affair!"

"Sure!" Retzsky's lips twisted sarcastically. "Back to work at eighty cents an hour so you can pull down a hundred thousand a year! We know our rights as human beings! Unless you give us what we ask for, not another rocketship will leave this factory.

A roar of assent went up from the mob; the workers edged nearer, menacingly."

"Retzsky, you're a fool!" Banning shouted. "I'll—" His voice trailed off into nothingness; jerkily, like a marionette, he descended the steps. At that moment a similar change had come over Retzsky. Side by side the two men marched from the factory grounds, eyes fixed eastward, seemingly oblivious of one another.

Mystified, the strikers stepped aside, allowing them to pass. A frightened hush fell over the crowd as they saw the blank, expressionless face of the two men. Overcome with quick panic, they ran back to the shops. On the highway leading toward the towering Rockies, two doll-like figures walked mechanically, one in imported tweeds,

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the other in grease-stained overalls.

Far out on the north Atlantic a raging gale lashed the billows into a frenzy of furious action. Covered with ice, spattered with spume, the rusty freighter wallowed slowly ahead, boring its blunt nose into the trough of the waves. Occasionally, when a comber larger than the others would lift her stern clear, the propellers, spinning crazily in empty air, would send a racking shudder thoughout the ship.

In the pilot-house the gray-haired old quartermaster, his eyes on the binnacle, turned the wheel with a monotonous sort of rhythm. From time to time he would flip open the heavy glass housing and send a stream of tobacco juice jetting into the wind. Now and then a flash of light would illuminate the black waves as a rocket-ship, exhaust-tubes flaming, passed overhead.

The old man sighed. Few surface vessels left, now, and few men to handle them. In another five or ten years the remaining rusty old hulks like this would be gone. The quartermaster shook his head, straightened up as the mate, slapping the sleet from his oilskins, entered the pilot house.

"Nasty night!" he exclaimed. "Eh, Mike?"

"Seen worse," the old man muttered. "Hurricanes off the Horn, with St. Elmo's lights at the mastheads, and the spirits of drowned men, all white with seaweed in their hair, following the ship like sharks. Aye, standing on the wave-tops they'd be, staring, and calling to us piteous like. Calling, always calling—."

"Huh!" the mate snorted derisively. "What a yarn! D'you think I believe such."

"Mr. Blain!" Old Mike, staring at the mate's drawn face, gave an involuntary shudder.

Stiffly, somnambulistically, Blain strode from the wheel-room, a robot in oilskins.

"Mr. Blain!" Mike's voice rose to a despairing, horror-packed scream.

The mate did not answer. Stopped by the rail, he hesitated, then threw one leg over it. For an instant he straddled the rail, sharply silhouetted against a cloud of flying foam. Then he threw the other leg over and was gone. In the pilot house old Mike crossed himself and mumbled a prayer.

THE lobby of the Schuyler House was a succession of smiles as the boy and girl entered. The desk clerk smiled at the boy's feeble attempt to write "Mr. and Mrs." in a nonchalant, accustomed manner. The bellhop smiled, noticing the grains of rice on the girl's shoulder, and sprang briskly forward in anticipation of a large tip.

The elevator operator smiled at the air of excitement, of eager joy, that stamped them as newly-weds. The boy and girl smiled, too, as they walked along the corridor, tender, intimate smiles meant only for each other. When the bellhop had at last left them alone in their room, the boy swept her into his arms.

"Happy?"

"More than anyone has a right to be. You—You'll never regret our marriage, Jerry?"

"Do you need to ask? If only there were some new way to say all the old things that have been said a million, million times in plays and songs and stories. A new way of saying—I love you."

The girl's lips brushed his cheek.

"You'll never leave me, Jerry? Promise you won't! Ever!"

"Never, dear. I promise." Suddenly his arms fell to his sides. Spinning about, he opened the door, walked heavily from the bedroom.

"Jerry! You look so strange!" Her voice was frightened. "Jerry! Come back!"

The boy, walking along the corridor, did not turn. The girl threw herself upon the bed, her body racked with sobs.

CHAPTER III

The Lemmings

JOHN CROSS paced the floor of the dusty old library with quick restless strides. On the moth-eaten sofa Anna Coar, a pale, wax-works figure,

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lay still; the barely perceptible rise and fall of her breast, the rigidity of her limbs, indicated that she was still under the effects of the thorene.

Glancing at her, Cross felt a more than passing interest. She was so quaint in her old-fashioned dress—like a picture from some old book. And she was beautiful, with a direct, honest beauty entirely different from the langorous, exotic type that was all the rage today. Simple, primitive, unsophisticated, like the life of 1940. Perhaps—Cross turned as Bronson and Frome stepped through the secret panel.

"Cross!" Bronson tugged excitedly at his beard. "That man Coar was the greatest genius of all time! We'll need an entirely new system of mathematics to comprehend his theory of absolute time!"

"And the electronic matter!" Frome's round moon face was glowing. "It will revolutionize chemistry! Why in the organic field alone—!"

"Very interesting." Cross glanced toward the grimy windows. Outside a cold gray dawn was breaking—a dawn of scudding leaden clouds, of strong, steady winds, of sullen, relentless waves. The island's rocky shore was yellow with foam and the wind-bent trees shivered, raising their gaunt limbs as if in supplication.

"Morning!" Bronson exclaimed. "I had no idea we were so long examining the laboratory. Where's Vettner?"

"Wish I knew!" John Cross' dark eyes seemed troubled. "You remember he said he'd be back in an hour or so. Even with our modern planes accidents sometimes happen. And the girl will be awake any minute now."

Before anyone could answer, the faint hiss of rockets sounded above the thunder of the surf. There was a flash of silver and Vettner's sleek little ship swooped down upon the barren field.

"Ah!" Frome gave a wheezing sigh of relief. "At last!"

The door of the house swung open. Vettner, his arms filled with packages, his white hair awry, burst into the room. Cross, bending over the girl, straightened up.

"Have trouble getting the dinitroixol?" he asked.

"Trouble!" Vettner placed the packages upon the table, pressed his hand to his forehead. "The world's gone mad! Men, women, and children are moving like sleep-walkers toward the lake! Thousands, maybe millions of them, all over the country! People from every walk of life! Dropped whatever they were doing last night, started to converge on Chicago! Some strange instinct like those little rodents the lemmings of Norway! Just as some strange force causes them to destroy themselves, some strange force is drawing these people to the city of Chicago. Nothing can stop them, nothing seems to be able to reach their minds! They're cut off, things apart!"

As these disjoined, incoherent words tumbled from Vettner's lips, Frome and Bronson exchanged significant glances. Frowning, Cross studied the old scientist's white cheeks, deep, panicky eyes.

"I know!" Vettner laughed harshly. "I couldn't believe it myself at first—until I saw one of them! Perhaps this will convince you!"

OPENING one of the bundles upon the table he brought to light a small, compact audiovisor set. Adjusting the connections, he unrolled the asbestoid screen and twisted the dials. A commentator's grave face appeared on the screen, his voice issued from the little speaker.

"Striking between the hours of nine and ten last night a strange and absolutely unprecedented catastrophe has swept over the United States. Men, women, and children, impelled by some strange hypnotic force are converging upon the Midwest, at a point roughly established as Chicago. Unofficial figures place their number at close to a million.

"Scientists, completely at sea, claim that it is a form of telepathy, that some overwhelmingly powerful brain-force has gripped the minds of these people, is drawing them by sheer strength of will to an unknown destination."

"Perhaps the most baffling feature of the disaster is the variety of people obeying the call. So far there has been

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no connecting link established. Miners, farmers, mechanics, clerks, millionaires, housewives—every type of individual had obeyed this mysterious call. Yet of men working side by side, some will be called and the others not. A husband called, and his wife exempted. Life-long friends separated . . . life-long enemies walking next to one another." The commentator turned as a note was slipped into his hand.

"Here's a dispatch from Europe, stating that a few isolated cases have been observed on that continent. America, however, is the chief sufferer, particularly the Midwest. Wait! Here's another flash! Ladies and gentlemen, the call has been definitely established as an attempt at mass suicide precisely as in the case of the Lemmings! There is the same tendency to seek a body of water and destroy themselves.

"Already several hundred of these unfortunate people have walked blindly into Lake Michigan to drown! Others moving in the same direction are only prevented from doing the same by barriers of barbed wire hastily thrown up by the state militia! We will now transfer you to our announcer in Chicago! Take it away, Chicago!"

"God!" Frome's flabby lips trembled. "Horrible! We must return—"

"Quiet!" Vettner whispered.

Another announcer's face appeared on the screen. Below the balcony on which he stood, they could see a crowded street of the lower level. Sunlight, pouring through the glassex streets of the levels above, revealed a barbed wire entanglement, backed by grim-faced militiamen. Stiff, zombie-like figures, hands and bodies torn by the barbs, pressed relentlessly against the wire. Their blank, far-away expressions, their unhesitating singleness of purpose, was somehow terrifying.

"Speaking to you from the waterfront at Chicago," the announcer said crisply. "The scene which you see below is being enacted along the entire shore-line. The Lemmings, as the newspapers have dubbed these unhappy persons, heed nothing but the call. Increasing momentarily in numbers it is only a question of time until they break through the barriers and walk into the lake.

"The strength of these people seems to be superhuman. In Cook County a thousand of them burst through a brick wall. Many, those in front particularly, were crushed, but the others went on. Nothing can stop them. On LaSalle Street a ditch was dug in hopes of halting them, but they kept crowding forward until it was filled with bodies and then the survivors crossed."

THE announcer paused for a moment then continued.

"So far we have had to contend only with those in the Chicago area. When the others from all over the country arrive, it will be impossible to check them. Already some are beginning to filter in. Reports from the suburbs are unbelievable. Isolated cases in rural districts were overwhelmed by sheer force and confined.

"This was proven to be fatal for they would beat themselves to death against their prison walls. Everywhere one sees them, walking stiffly across fields, through forests, along highways. Some in overalls, some in dinner clothes, some in pajamas. Already hundreds have been killed by walking into the paths of cars or trucks, by trying to cross streams that were too deep.

"Many of them, encountering an obstacle such as a house or wall, will stand there beating against it like a fly on a window-pane until someone leads them around the obstruction. They neither speak nor, apparently, are conscious of anything about them. Large numbers, no doubt, will die from lack of water, unless the power that calls will in some way sustain them.

"To add to the general confusion, all industry, missing a man or two here and there, is crippled, while national guard and Red Cross units from all over the country are crowding the city. In some cases, families of those called accompany them, pathetically hoping that the hypnotic force will wear off and permit them to lead their loved ones home. Many—Look!"

The announcer spun his projector to the street below. The ever-increasing crowd of Lemmings had suddenly

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burst the rows of barbed wire, were pouring through the gap, leaving scores of crushed and mangled bodies in their wake. Then they were checked by the second barrier that the national guardsmen had been frantically constructing.

As they surged against the wire, it became apparent that this second line of defense must in time give way. And after that they had only to cross a hundred yards of street to reach the docks. The soldiers, throwing up a rough barricade of boxes and bales, showed fear of being swept by the blank-faced Lemmings into the icy water.

Once again the announcer adjusted his projector, bringing to the screen a close-up of the mass of humanity straining against the wire. Bronson, noticing a slender, gray-haired woman in the front row, staggered to his feet, gasping with horror.

"MARY!" he choked. "Mary—my wife—one of them! God! Oh, my God!"

As he spoke, the woman, her arms horribly lacerated by the barbs, slumped to the ground. Others, crowding forward, spurned her underfoot. Bronson fell back into his chair, buried his face in his hands.

The announcer's voice, automatically calm, continued speaking. "Many of our leading citizens have fallen victims of the call. Chief Justice Hinton and his four children . . . his wife was spared. Also, curiously enough, Mayor Hinton of Baltimore. And also the founder of—"

"Vettner!" John Cross leaped to his feet. "It—it's incredible, but— Is this a two-way communications set?"

"Why, yes!" The white-haired scientist, who had been trying to console Bronson, glanced up in surprise. "You have only to reverse the neutronic lead-in terminals, connect the microphone. But I—"

"Good!" Cross bent over the set, made the necessary adjustments. "Bureau of Records, Chicago! At once! This is of the most vital importance! Yes. It may solve the case of the Lemmings. Marriage licenses for the year 1940 . . ."

WHILE Cross was speaking, the girl on the sofa stirred, opened her eyes.

"Who are you?" she whispered, glancing about in bewilderment.

"Scientists of the year 2240," Frome said quietly. "You have been in a state of absolute time for three hundred years."

"Three hundred years!" she repeated unbelievingly. "But that's impossible! My father forced me upon that table in his laboratory and an instant later you were in the room. Then one of you shot a hypodermic into my arm and I fell asleep!"

"That instant to you, immurred in absolute time," Frome said, "was three centuries in our relative time. A hundred centuries would have seemed no longer."

"Oh!" Tears glazed Anna Coar's dark eyes. "Ralph! Ralph! Dead for years! No friends, alone in a strange, new world!" She fell back weakly, sobbing.

CHAPTER IV

Thought Inheritance

CROSS, who had been speaking softly into the audiovisor's mouthpiece, snapped it off, picked up the vial of dinitroixol that lay on the table.

"Here," he said, pouring several drops into a teaspoon. "Drink this."

The girl obeyed. Under the influence of the powerful stimulant color flooded to her cheeks, and her heart beats became stronger.

"Fine!" Cross nodded. "Miss Coar, I haven't much time to explain. Many persons are in danger and you may be able to save them. See if you can remember what thought was in your mind for that split second which was to us three hundred years."

"Thought?" Anna's brow wrinkled in concentration. "Why, I—I was wishing that Ralph would come to me, save me, when my father pulled that switch. And then you were in the laboratory."

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"Exactly." Cross straightened up, his face grave, and turned to the others. "Gentlemen, I think the secret of the Lemmings is solved! When that announcer said that several persons named Hinton had been called, I suddenly remembered that according to Coar's message, his daughter's fiancé was also named Hinton. Coar also stated that the shell of electronic matter which surrounded her was impervious, that nothing, not even waves or vibrations could pass through it.

"Now consider this! Thought is an electrical vibration. In the year 1937 that pioneer of all telepathists, Dr. Rhine of Duke University, proved fairly conclusively that thought can be transmitted, given a sufficiently strong mental impulse and a recipient of extra-sensitory perception.

"Subsequent tests have proven that the latter qualification is not necessary if the thought is sufficiently powerful. We have commonly transmitted thoughts over short distances, although intervening thoughts, like interference in radio, have made it impracticable for anything other than a hobby. Yet a tremendously powerful thought impulse would be able to override interference, go vast distances.

"Within her wall of electronic matter Miss Coar had only one thought, a desperate call to her fiancé, Ralph Hinton. While to her only a fraction of a second elapsed, that thought, reiterated for three hundred years, increased like static electricity gathering within a strom cloud.

"Last night at about nine-thirty we broke that wall which surrounded her. Like a tremendous electrical charge that thought-wave burst forth, driving all else from the brains of a million people, filling them with only one desire—to come to this island!"

"But the call was for Ralph Hinton!" Vettner expostulated. "And he's been dead for years!"

"True!" Cross nodded. "But his decendants are not! From the Record Bureau just now I learned that Ralph Hinton, instead of spending the rest of his life pining away for his lost Anna, married another girl two years later. More, they were blessed with ten children. You can see that in three centuries he would have over a million descendants—descendants who, in accordance with the laws of heredity, possessed some faint traces of his identity. Men and women of every type and class, yet each having within them some small part of Ralph Hinton, just as, for instance, Negro blood can be traced among Caucasians for generations after the original intermarriage. These are the people who Miss Coar's thought impulse, calling for Ralph Hinton, has struck an atavistic note in the minds of his descendants and, through its terriffic intensity, is drawing them to this island!"

AS Cross finished speaking, an awed hush fell over the dusty, smouldering room.

"Fantastic!" Vettner muttered. "These are theories utterly new to science!"

"The forces released here by us," Cross replied, "are equally new to science. Theories concerning them must necessarily sound fantastic!"

"Wait!" Bronson raised his bloodshot eyes. "My son! Will he be one of these Lemmings, too?"

Cross nodded.

"He has inherited the strain from his mother," he answered slowly. "If she went, he must also."

"God! God!" Bronson bowed his head. "Am I to be spared nothing? Look, my boy was in Evanston yesterday. It will be another day before he can reach Chicago walking. Can't we do something—anything?"

Anna Coar stood up, pale, fragilely beautiful, her soft brown hair hanging in waves about her shoulders.

"I have caused all this suffering," she whispered. "To these innocent people."

"Unintentionally," Frome said soothingly. "Even your father could not have known that this would happen."

"But is there no way for me to save them? Cannot my thoughts which brought them to the edge of the lake, also send them back? Perhaps if I were to concentrate."

"No." Cross shook his head. "No

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amount of human concentration could in a few hours produce a thought vibration that would be equal to the powers of one accumulating for three hundred years. You, the only one who can save them, are powerless! There is no way!"

"No way?" Bronson whirled about. "There is a way—if you dare take it!"

"A means of releasing their minds from that grip?" Cross laughed. "Only by a thought vibration of equal intensity."

"Exactly." Bronson's voice rose excitedly. "Thought is an electrical impulse, you say. In the laboratory below there are vast step-up transformers, amplifying tubes. Using Coar's equipment and the power-unit from our rocket-plane, I could build a machine that would increase the barely perceptible electrical impulse of a human thought to a vibration equal to the one that summoned the Lemmings!

"Why, I believe it could be assembled in an hour!" Bronson's excitement was mounting. "A simple matter with all the machinery downstairs! As simple as a small radio broadcaster!"

"The mechanical part, perhaps." Cross' tanned face was bleak. "But how can you transfer human thought to a machine?"

"Why—" Bronson hesitated. "Fine wires, as thin as hairs, touching a nerve of the brain."

"What!" Cross' eyes grew hot with anger. "You suggest that I perform a delicate, absolutely unheard of brain operation in this filthy den? No instruments, no assistants, no equipment! Why it's madness! Remember, in order to be thinking the correct thoughts at the moment of contact, Miss Coar would have to remain conscious! Can you conceive of such an operation without anaesthesia? No, Bronson, the thing is impossible!"

BY way of answer Bronson crossed the room, snapped on the audiovisor. On the screen appeared the dull-faced, robotlike Lemmings, the weight of their ever-increasing numbers stretching the strands of barbed wire to the breaking point. The militiamen, working frantically to strengthen the final improvised barrier of barrels and bales, seemed imbued with despair.

"No solution to the problem has presented itself," the announcer was saying. "Sooner or later the restraining walls must give way and these thousands of persons will plunge into the lake to drown. At the other barricades along the harbor front the situation is equally grave. Latest reports indicate—"

Anna Coar, seeing the Lemmings for the first time, shuddered. Suddenly, slim white shoulders erect, she turned to face the four scientists.

"My father created this horrible situation," she said firmly. "I cannot stand by and permit these people to die. Far better that I, an unhappy anomaly from a forgotten century, die to save them. Mr. Cross shall perform the operation!"

"No!" Cross protested. "It's unbelievable! I have no instruments! And the pain without anesthesia—" the doctor winced.

"It must be done." The girl's face was calm. "One life to save a million! There is no choice!"

"Brave girl!" Old Vettner bowed his head in admiration. "If you live, the world will see that your future holds only happiness, and if you die, you will be acclaimed the greatest heroine of all time!" He glanced up as Bronson touched his arm. "Yes?"

"We must begin work." Bronson's thoughts were on his son, somewhere among the crowds that approached the lake's edge. "At once!"

CHAPTER V

Rescue

FOR the next hour the four men worked with the frenzied haste of desperation. A coil of wire, attached to the powerful motors of the rocket-plane, led through the house to the laboratory below. Here, under Bronson's directions, Coar's great transformers were connected, the gleaming banks of amplifying tubes checked to see if, af-

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ter three centuries, they were still serviceable.

With incredible speed a clumsy mass of wire and machinery took shape in a corner of the laboratory. Anna Coar had brought the little audiovisor set downstairs; she sat staring at it, pale with horror at the sight of those maddened men and women beating against the tangle of barbed wire.

The four scientists, driving themselves relentlessly, were just tightening the last connections of the thought-intensifier when they heard Anna scream.

"The barrier!" she cried.

All eyes centered upon the audiovisor screen. The taut wires had snapped like pack-threads and the Lemmings rolled forward, an inexorable tide of humanity, upon the last flimsy barricade. The national guardsmen, panic-stricken at the thought of being swept into the cold black water, ran for safety; the wall of barrels and boxes creaked, swayed.

"No more time!" Vettner muttered. "We must begin!"

"But—but—" Frome's flabby face trembled. "We need condensers! And additional spark-coils! There should be a test to see if—"

"I am ready." Anna Coar stretched out upon the table, lay still.

Hands trembling, John Cross took a gleaming scalpel from his bag. The feel of the cold cello-steel gave him courage, strength. Carefully he shaved away a patch of the girl's thick hair, then, with one lightning-quick sweep cut loose a circle of her scalp, exposing the bone of the skull. Anna Coar moaned softly, but did not move.

Deftly, Cross applied clamps to the veins, wiped away the blood. Picking up a tiny electric drill that had been part of Alexis Coar's laboratory equipment, he dipped it into a bowl of antiseptic, began to cut loose a circular section of the skull itself.

Unbearably painful, this drilling of the bone was a strain upon the nerves that few people would have been able to stand. As white as paper, the girl lay rigid, her hands gripping the sides of the table, her jaws locked like a vise. Vettner, Frome, and Bronson, standing in the background, were as pale as the girl herself, their foreheads beaded with sweat.

"Only a minute or two before the crumbling barrier gives way!" came the voice of the announcer from the other end of the room.

SUDDENLY, Cross dropped the drill, pried up a circular piece of bone, exposing the girl's living, palpitating brain. A blue-lipped automaton, Bronson handed him two tiny wires, as fine as hairs. The surgeon gave a signal to Frome and Vettner, who stepped up to the table, gripping the girl tightly to prevent an involuntary movement. Bronson touched a lever and the crude machine in the corner began to hum.

Cross' hands were not trembling now. With unerring skill he thrust the two wires downward into the gray, pulpy mass of Anna Coar's brain!

A shrill bubbling scream burst from the girl's lips. Then, unable to bear the searing torture, she fainted.

It took all of John Cross' will-power to force the six drops of dinitroixol between Anna's lips, knowing that the powerful stimulant would bring her back to the agony of consciousness. Her eyes, fluttering open, were deep pools of pain.

"Think!" he whispered. "Tell them to go back—away!"

The girl's forehead wrinkled in concentration.

"Ralph!" she murmured. "I don't need you! Don't need you! Go—go back!"

In the corner of the room the rows of tubes glowed, the great transformers roared and crackled. A dazzling blue flame leaped like a bolt of lightning from the terminals with a thunderous crash! A smell of ozone permeated the room. The four men staggered under the impact of the mighty forces released, their minds numbed. A despairing cry from the audiovisor sounded dimly in their ears. Wheeling about, they saw the last barrier topple with a crash to the ground. With their mechanical, unhurrying stride the Lemmings advanced toward the water's edge.

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And then, all at once, they stopped! Blank faces were suddenly contorted with fear, with bewilderment; weary bodies drooped from exhaustion, slumped to the ground. Like children awakening from some terrible nightmare, the lemmings gazed helplessly about, a hundred questions in their frightened eyes.

"Success!" Vettner choked. "Thank God!"

Swiftly, surely, Cross removed the wires, wedged the section of bone into place with slivers of silver, and sutured the scalp.

He had just finished bandaging the girl's head, when an almost inaudible whisper escaped her lips.

"Did—did we save them?"

"Your courage saved them." Very reverently, Cross bent to kiss her cheek.

"Oh!" A ghost of a smile flickered about the corners of her mouth. "I'll never regret Ralph now—now that I've met you, John."

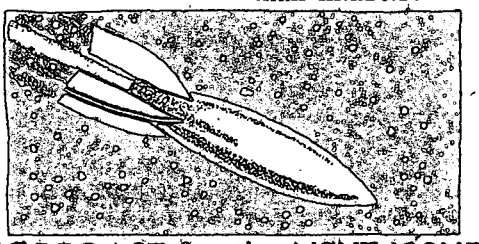
Cross stared down at her slim, brave beauty. The announcer's awe-stricken voice beat upon his ears. "—the greatest and most mysterious catastrophe ever to descend upon our continent averted by a miracle. Thousands of American homes tonight will offer thanks to the unknown benefactor who has saved—"

Once again John Cross bent to kiss the girl.

"Anna!" he whispered.

Frome, wiping the sweat from his red face, chuckled.

"Among other claims to fame," he wheezed, "Cross'll be the first man to have a wife three hundred years older than himself!"



FORECAST for the NEXT ISSUE

PERRY HOWE came from a family whose tradition was to smash speed and endurance records. It was a Howe who had made the first round trip to Saturn and back, solo, in less than three days. Perry Howe's father had made the Pluto run in 60 hours. Later, Royce Howe, his eldest son, had eclipsed that record. He drove his ship so relentlessly that it exploded when it had landed on Earth.

Now Perry Howe was going to shatter all existing records for a flight around the Solar System! In next issue's novelet, THE JULES VERNE EXPRESS, Eando Binder annihilates space and time as Perry Howe roars by with super-velocity in the rocket race of the centuries!

* * *

A SECLUDED labyrinth of black, dustless, germless laboratories zigzags across the top floor of the main building of the Rockefeller Institute for Medical Research in Manhattan. Only scientists interested in fractioning life to its lowest common denominator work there. And all must wash their hands and faces, put on gowns and hoods of black cloth—all except the master of this pure and dark domain. He, the most famous member of the Rockefeller Institute, Dr. Alexis Carrel, distinguishes himself from the others with a little white headpiece that looks like the hat of a U. S. bluejacket.

Another thing that distinguishes Dr. Carrel from other scientists is his miraculous medical machine, the Lindbergh perfusion pump, perfected in collaboration with the famous aviator.

Ward Hawkins, popular author of adventure fiction, uses the Lindbergh perfusion pump as the basis for a stirring interplanetary novelet, MEN MUST DIE. It appears complete in the next issue, as up-to-the-minute as tomorrow's headlines!

* * *

MILLIONS of years ago, in the remote prehistoric past, an ice age gripped the continents of the world. And now, eons later, a cold doom once more sweeps the earth. In WHITE BARRIER, a novelet by Frank B. Long, Jr., also in the next issue of THRILLING WONDER STORIES, beings from a plane almost beyond conjecture spread chaos over America. WHITE BARRIER is a gripping story of—the eighth dimension!

* * *

Many other novelets and short stories by star authors in the next issue of THRILLING WONDER STORIES. Also, more SCIENTIFACTS, another SCIENCE QUIZ, IF, and all our other regular features. And don't forget—The Tenth Anniversary issue of T. W. S. will soon be here! Look forward to it.

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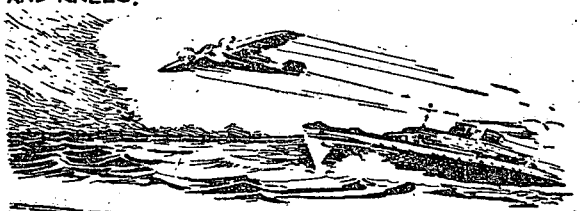
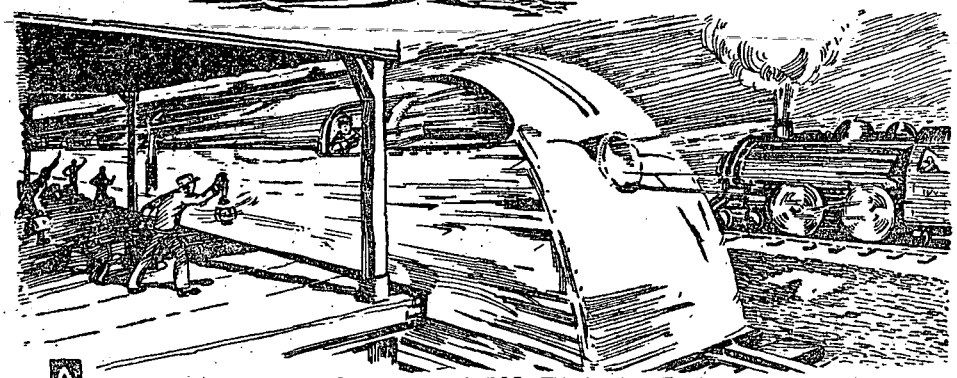
THERE WERE NO FRICTION!

BY JACK BINDER

SUPPOSE ALL FRICTION WERE SUDDENLY TO CEASE, DUE TO INEXPLICABLE LAWS GOVERNING MOLECULAR SURFACES. IT WOULD RESULT IN THE MADDEST HOURS IN THE HISTORY OF MAN. IN THIS FRICTIONLESS WORLD, EVERYTHING FEELS AS SMOOTH AS GLASS. SIDEWALKS, CARPETS, FLOORS AND THE GROUND ARE LIKE SUPER-SLIPPERY ICE. PEOPLE CAN HARDLY WALK UPRIGHT. MOST OF THEM CRAWL AROUND ON HANDS AND KNEES!



AIRCRAFT AND SHIPS, HOWEVER, CONTINUE TO OPERATE··· AND BETTER THAN BEFORE! THEIR MOTION THROUGH AIR AND WATER IS OPPOSED NOW ONLY BY DIRECT PRESSURE FROM THE FRONT, NOT BY FRICTIONAL RESISTANCE. RECORDS IN SPEED AND LOW FUEL-CONSUMPTION ARE MADE!



AUTOS, TRAINS, TRUCKS, BECOME USELESS. THOSE THAT ARE STANDING STILL WILL NOT START. THEIR WHEELS SPIN WITHOUT TRACTION AGAINST THE GROUND. THOSE IN MOTION BECOME DERELICTS OF SPEED: FREQUENTLY UNABLE TO STOP WITH THEIR FRICTIONLESS BRAKES, UNTIL RISING GRADES SLOW THEM DOWN. TERRIBLE ACCIDENTS OCCUR EVERYWHERE!

Next Issue: IF THE

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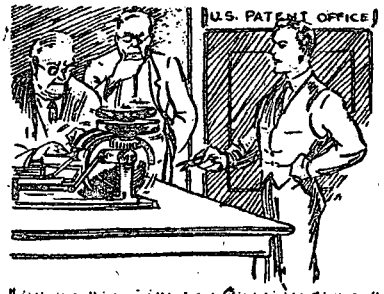
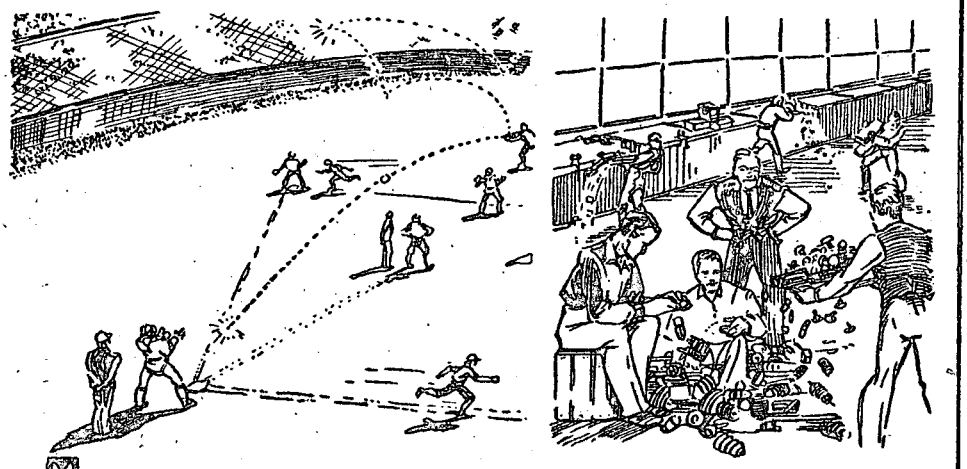


ENGINES BECOME VERY EFFICIENT, WITHOUT THE INTERNAL DRAG OF THEIR MOVING AND RUBBING PARTS. HUGE DYNAMOS TURN OUT ELECTRICITY AT A FRACTION OF ITS FORMER COST. PERPETUAL MOTION MACHINES, UTILIZING THE ENDLESS POWER OF GRAVITY, NOW WORK!

IN THE HOME, DISHES SLIDE OFF TABLES BECAUSE OF SLIGHT OFF-BALANCE, UNHINDERED BY TABLE-CLOTHS THAT BECOME SMOOTHER THAN SILK, WITHOUT FRICTION. MOVING FURNITURE BECOMES CHILD'S PLAY. STAIRS CANNOT BE CLIMBED WITHOUT AN ALPEN-STOCK. MATCHES DO NOT WORK!



MOST INDUSTRY IS PARALYZED. FACTORY WORKERS CANNOT GRIP THEIR TOOLS AND IMPLEMENTS EXCEPT WITH TIRING MUSCULAR PRESSURE. EVERYTHING IS LIKE A GREASED SURFACE. HEAVY THINGS MUST BE PICKED UP FROM UNDERNEATH ALL SPORTS ARE A FARCE. IN BASEBALL, THE BALL BOUNCES OVER THE GROUND AND CAROMS FROM THE FENCES LIKE A ROCKET, WITH NO FRICTION TO STOP IT!

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An Eternity of Time Speeds by as Bart Haskell Is Catapulted Into a Prehistoric Age!

I suddenly had the sensation of falling down an interminable stairway

THE DISCARDED VEIL

By ARTHUR J. BURKS

Author of "Dictator of the Atoms," "Manape the Mighty," etc.

"LISTEN, Bart Haskell," said the chief engineer, "you're just an assistant on this job, don't forget that! *I'm* the works here! You're being pretty forward for a chap just out of school, where, I understand, you didn't distinguish yourself much at that!"

I grinned at Murgatroyd, chief engineer on the Grand Coulee Dam. He couldn't get me down. I'd reported for duty on the Dam, and with my very first glimpse of Grand Coulee I felt that I was coming home. I had the feeling that this was *my* country; this job was *my* job; the Dam a task that had always been *mine*.

If I emphasize these points I should be forgiven. After all, I was not the first human to visit a place I knew I had never seen before—certainly not in this life—and felt sure, on the instant, that I had visited it hundreds of times before. It is a common, more or less,

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experience peculiar to all mankind.

I got right to work on my job, and from the very first I began to distinguish myself. Theorems, calculations that had been like nightmares to me in college, fell into place in my mind, and were suddenly not only simple, but workable. In two days' time even Murgatroyd was coming to me with problems. In a week he'd calmly tossed me the job of working out the entire system whereby the government intended to reclaim something like two million acres of arid land. This job took me over every inch of the project, from the Dam itself north to Kettle Falls, almost to the Canadian border, and south to Columbia Siding, clear across the vast acreage of Columbia Basin. And every inch of the vast territory was as familiar to me—*before I stepped foot on it!*—as the palm of my own hand.

I would play a game with myself.

"Bart," I would say to myself, "around that big monolith of stone there is an out-jutting stone shaped like a mammoth."

I'd go around the monolith, and there would be the stone, shaped like a mammoth, just as I had known it would be. It ceased to be uncanny, after a few days. I accepted it, even though I could not understand it. I *knew* this territory, though I had never before seen it.

Even my ancestors, as far back as I knew, had never been here. I stopped bothering about it—until the day I started to climb a crevasse leading to the top of Steamboat Rock, about midway between Grand Coulee Dam and Dry Falls.

That was familiar, too. And halfway up the crevasse I came to a cave in the brown basalt rock. I entered it. It was even more familiar than other landmarks I had found. *This place had been my home!* That was the feeling I had, even while I told myself it couldn't be true.

I TURNED on my flashlight and studied the place. There were crude pictures on the walls—ancient pictures such as no Indians had ever left on the ageless rocks of the coulees of this area of Washington State. Yet people had occupied this cave. And if they hadn't been Indians, there was but one other answer.

This cave had been occupied by cliff dwellers just before, during, or just after the Ice Age!

That would mean that these cave-dwellers had lived on Steamboat Rock, when it had been a monstrous island in a gigantic flood.

But *I* hadn't lived here. Yet, why did the whole area seem so familiar?

For the next week, every time I had an hour to spend, I climbed that crevasse, entered the Ice Age cave, and did some excavating. As each day passed I became more and more excited as I dug into the history of a vanished race. I knew of just one other place where traces of that race had been discovered: France. I was digging, I was sure, into the past of the Cro-Magnon, or a contemporary people.

Absurd? But wait! Fifteen feet below the floor—the floor as I had first found it—I came across a plast-iron mask. I didn't know what it was, had no name for it. I'd never seen that kind of metal before. It was, I noted, somewhat tougher than rubber, but oddly like it. It made my hands tingle, just to feel it. I didn't tell anybody about that mask, but when I asked Murgatroyd if I could make a hurried flight East, to consult the world's foremost paleontologist, he agreed without hesitation.

So I dropped into the office of Jason McKellar, showed him the mask. A strange expression came over his face. I told him my story of the find, and of my strange "memory" of locations in Grand Coulee—my idea that people had lived there before the Ice Age.

"Possible," he said, "and probable. Princeton University has an extension in the Beartooth mountains, not *too* far southeast of your Grand Coulee, for physical research in paleontology. Two years ago they uncovered the fossil of a man, at least a primate, that had been laid down in a rock formation estimated to be at least sixty-three millions of years old. Their findings haven't been published yet, and probably won't be until they have taken the

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whole story from the rocks. But this mask, now—"

"What is it made of?" I broke in eagerly.

"I don't know just what it is. Plastic iron is the name that comes closest. Call it plast-iron."

Thoughtfully he put the mask over his face, holding it in place with both hands. I saw those hands begin to tremble. He swayed. He stood there for a long time. Then he sat down, still holding the mask, and I thought he had fainted, with his hands still holding the mask over his face.

Alarmed, I took the mask from him. His eyes were set in a stare which gradually gave way to recognition of me, the time and place. He was like a man coming out of a hypnotic trance.

"Remarkable!" he said, softly. "But more investigation is required."

"What," I asked, "are you driving at?"

"I've always held to the idea that human memory was passed on in the genes, explaining strange 'memories' by humans of places they *knew* they'd never seen, the flying-falling dreams, the hopeless-race-against-death nightmare and the like.

"This mask has some strange property—some hitherto unknown metallic property which causes it to reflect the inherited thought waves passed down the generations in the human embryo. Just now, by wearing it, *I traveled back along the unknown, invisible lines of racial memory!* Not hazy, instinctive, as happens with so many of us, but gradually sharpening, becoming clearer the longer I wore the mask. I am sure if I *continued* wearing it I would have traveled back through the ages—mentally. Is it radio-active? I don't know, but certainly something like it, operating in a way that future investigation may disclose.

"Nor would it be miraculous, exactly, any more than our present knowledge of radio-activity. With telephone and radio we can bridge time and space. With the plast-iron mask possibly we can travel mentally into the distant past, into yesterday, back to the moment when an ancestor first discovered that he was a reasoning being.

"The mask is a reflector—a *time* reflector, and proof, if investigations support my theory, that time itself does not 'pass,' that it stands still, that only living things pass, and that every living thing that has existed in the past can be contacted, at least mentally, through time's own reflection of memories on the plast-iron mask, when the human brain of the moment of wearing the mask, sets up vibrations by the mere exercise of thought."

"What use can we make of it?" I asked, feeling a little frightened, as though I stood on the threshold of a room bigger than all creation.

"I'm not sure. How's your courage? Are you willing to go back to Grand Coulee and experiment with this thing? If you're right, and paleontologists are right, and your 'memory' of Grand Coulee isn't a phantasm of some kind, maybe—"

HE left it there, shaking his head a little.

"Of course," I said, "I will continue to experiment."

"Notice the shape of this thing?" he said suddenly. "Covers the eyes and forehead. No eye-holes, you'll notice. It's man-made, and it has been used for a purpose. Just as *you* have been used for a purpose to work out in a vast cycle of time, a destiny I'd give a thousand reincarnations to own! All I ask is that you keep me posted. Write me a letter every day, telling me your experiences of the previous *night!*"

Right then it didn't make sense. But I went back to Grand Coulee with the mask. In my room that first night after my trip I decided I'd try and figure out what McKellar was driving at. I was too excited since my talk with the great scientist to sleep. Actually, I hadn't had a decent night's sleep the whole time I was away. I decided that I'd wear the the mask in bed that night while I got some sleep, which I sorely needed.

I undressed, donned pajamas, dropped onto my bed, put the mask over my eyes and forehead. *The mask fitted me perfectly.* I got a kind of chill at my discovery.

No sooner had I dropped back on the

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bed than a queer thing happened. How does one describe a feeling, a sensation, that no other man or woman of recorded time has experienced? First, as soon as I donned that mask I knew exactly what was meant by thought-waves, for the first time. I could *feel* them spear out of my brain, reaching out into space—and time, too, for all I knew. Only, like arrows shot against a stone fortress, they struck the plast-iron mask and were deflected into the stream of time! The mask, then, was not going to let me go to sleep, but was going to make my brain work overtime.

My brain had become a dynamo, building up energy and power through that mask. The energy and power of a human brain capable of building dams, pyramids, of designing stratosphere planes, even space ships, of conceiving of almost everything under the sun. In other words, the human brain could, if properly understood, turn man into a god!

I got a little scared as the "dynamo" grew in strength, as genetic waves piled up and were concentrated in that plast-iron mask. It came to me, with increasing clearness, that by some strange property in the plast-iron, I was gradually learning how to use the *four-fifths, or seven-eighths of the human brain that man, if he ever knew, had forgotten how to use.* Even savants used only the skimmed tops of their brains. Now I was going to be able to use it all!

I suddenly had the sensation of falling down an interminable stairway. I clung to the bed to keep from crashing into something. The coverlets felt safe under my hands. Then they, too, vanished into nothingness and I was falling through space. A vast roaring was in my ears, gradually growing louder—a monstrous, gargantuan, cataclysmic roaring. It wasn't until that moment that I knew I had actually been asleep, and was now coming awake!

Then, I *was* awake! But I was not in my bed! I flung out my arms, I touched a warm body—a hairy, naked body! I detected a musty smell. I heard a roaring. I cried out . . . .

For I was in the cave in the crevasse, halfway up Steamboat Rock!

I JUMPED to my feet. I shook the shoulder of the figure beside me—my wife. I knew it *was* my wife, for her shape was as familiar to me as my own. She turned over sleepily, smiled at me, and said:

"Having another nightmare, Gurda?"

Gurda, it appeared, was my name. I knew very well what she said, too, though I had never heard the language she spoke. It was very puzzling. She went back to sleep. Her name, I knew, was Kim. She was a lazy wench, enjoying every moment of sleep she could. I humored her, because I loved her to distraction.

That roaring sound got me, so I rose, stepped over her, noticed the familiar pictures on the rock wall—*familiar because I had painted them*—and went out into the crevasse. It was time to make an end of the dream. I'd go back to my quarters in Engineer City, tell my pals about it, and have a good laugh. I'd waken presently, of that I was sure.

Only, I saw right away that I couldn't get back—because Steamboat Rock was surrounded by a roaring flood of muddy, treacherous water! That was a distinct shock to me, because, according to the best geologists, there hadn't been water around that rock for anywhere from twenty-five thousand to a hundred thousand years!

I pinched myself, and it hurt. Then I saw that my fingernails were rough, broken and grimy. I walked up the crevasse to the top of Steamboat Rock. Only it's name was something else—I thought: Island Tor.

I gasped at what I saw. Grand Coulee was many miles wide, paralleled by mighty precipices. A macadam road should run along its floor. But there was no macadam road! Nothing but the swirling, muddy flood, reaching from wall to wall—a raging torrent several hundreds of feet deep!

I almost went crazy for a moment, when I realized what had, actually, happened to me. The plast-iron mask, out of the cave I had just left, had so concentrated my thought-waves that I had

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tumbled back down the centuries, along the stairs of racial memory—what else could I call them?—*to the time when I myself had been a dweller in the rock cave of Steamboat Rock!*

By donning the plast-iron mask, I had plunged backward through the misty veil of time, anywhere from twenty-five thousand to a hundred thousand years, taking back with me, however, the memories of my life in 1938, A.D.

Thus I knew, standing atop Steamboat Rock, that the geologists of my *yesterday's* time had been right. In gazing at that garganguan flood which roared about Island Tor, I was looking at the combined power of the Columbia, Frazier and Mississippi Rivers! I shaded my eyes and looked to the south where the three rivers plunged over what was to become known, eons hence, as Dry Falls. Mist rose there, shooting up across a three-mile front, to a height of a thousand feet. I was seeing, from above, and several miles away, the most magnificent waterfall that ever existed on this earth—eighty times the volume of Niagara!

Kim came to stand beside me. She was dressed in skins. Her face was dirty, and her hair hung in her eyes. But I didn't mind that in the least. I ran my hand over my own face and knew I looked a lot worse.

"I wish, Gurda," she said petulantly, not even glancing at the magnificent spectacle that roared around us, "you'd stop wearing that fool mask you made out of that funny stuff in the cave! It gives you nightmares. You mumble and I can't make out a word you say. You haven't been the same since you molded the mask!"

"No," I said, speaking in the same tongue as she and thinking in it—at the same time automatically translating it, mentally, into English, so that the alter-ego I had brought here with me from away up in the future should understand—"I haven't been the same. But until now I didn't understand why. It does something to my brain, Kim. Something marvelous and exciting. For when I wear this thing, and sleep, my thoughts pile up behind it, and you know what I can do?"

"No, and I don't want to know! Your crazy ideas will make me mad one of these days, and I'll break that mask you set so much store by! You're always having wild impossible ideas. If you were only more practical!"

I GRINNED, suspecting that women had been accusing men of lack of practicality for many millions of years, and, sometimes, making them believe it.

"Just the same, Kim," I said, "You're going to listen! When I wear this mask it shows me many tomorrows. I can see, for instance, a day when this great river will not flow around Island Tor, but shall be diverted to the north and west. And then all the land under the flood below will be arid. And no more water will pour over the Great Falls, and all the vast land that water irrigates will become as desert. And our people who live on its banks, and grow fat with plenty from the soil, will be forced to depart!"

Now, there was a strange thing here. I did not get this impression from wearing the mask, a fact which I realized instantly. I had taken it back with me, into the past, from my knowledge of my own *personal* present, to confuse and startle Kim.

Kim heard me as though I had spoken of the *past*, not the future, and so I knew that I could not touch her brain-waves with anything from my personal present, but only with memories we had shared between us. The plast-iron mask reflected only the past.

"Pooh," she said. "Not even the Great One could change the course of the Father of Waters. You're being silly and fanciful, as usual. I wish you hadn't found that stuff to make a mask of!"

"Just the same, I'm telling you the truth this time!" I said firmly.

She looked frightened.

"Suppose, just once," she said, "you *were* telling the truth, that what happened once might happen again? My parents, all my relatives, live by the side of the Father of Waters. If the waters dried up . . . ."

She left it there. So did I, knowing I could tell her nothing of the future

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because, *in our life together, ages ago, I had told her nothing of the future!*

Kim and I spent the day loafing on Island Tor, as we usually did. We fished when we were hungry, but for the most part basked in the sun and let life go by us, lulled by the majestic roaring of the Father of Waters.

When night fell we went back to the cave to sleep. She protested, but I insisted upon sleeping in the plast-iron mask. No sooner had I put it on than I awakened, pulled off the mask—and I was back in Engineer City, fatigued, intrigued, and a little frightened.

Naturally, I didn't tell the other engineers about it. But I believed every bit of it. I *knew* now the power of the human brain, when concentrated and reflected by the plast-iron mask. I had found the misty trail of racial memories leading back through the ages!

I worked like a Trojan during the day, impatient to end it so that I could go back to Kim at night. I knew why I was here in this spot *again*, after the passage of eons. It was my job to restore the fertile lands of Columbia Basin, that humankind might again live beside the great waters, this time harnessed for mankind's use.

A human brain had reached across the centuries at last. But I wanted to go back and forth as often as possible, in order to have the full story to report to McKellar. Also, I found it pleasant to share the lazy companionship of Kim. For she and I were to have children, that was plain—else how had the "I" of 1938 come into being at all? It staggered the imagination. If Gurda and Kim were killed somehow, before they had children, "I" would never be born! I knew they hadn't been killed, however, for "I" *had* been born. But I wanted to stay with them a while longer.

My hands shook as I adjusted the plast-iron mask, the second night. And I locked my door for the first time. I would have no interruptions in my across-the-eons tryst with Kim.

THAT ancient roaring wakened me, and I rolled over and shook Kim awake. She grinned at me. One of her front teeth was broken, but it only made her look nicer to me. Then she frowned, remembering something.

"Peer will be back today," she said. "Mother is probably sick of him. She's had him for seven days and seven nights, about all the time anybody could remain sane with him around!"

Peer, of course, was our son! I was so glad to escape his noise for seven days and seven nights that I'd forgotten all about him. Now Kim's mother—whom I didn't like much, and who liked me even less—was bringing Peer home.

We walked, yawning and stretching, up to the top of Island Tor, to see the old lady cross the muddy flood. She was an early old bird, that irascible, garrulous woman. She'd stayed with us a few nights since our marriage, and she'd always got up at the crack of dawn and given me a tongue lashing for lying down after the sun came up. I only hoped she'd leave Peer and go right back to her husband.

I breathed a sigh of relief when she did just that, and Peer, who was about three feet tall—four or five years old, I'd say—came bounding up the crevasse to rub noses with Kim and me. I waved a limp hand at Kim's mother, who pushed off her coracle and, with one oar, angled across the current for the misty southwestern border of the coulee. She traveled like a bullet. Her course was dangerous enough, for if she were taken over Great Falls . . .

Naturally, I never said anything to Kim, but there had been times when I wouldn't have minded if that accident *had* happened to the old termagant. But no such good luck attended her this time. Some day, maybe, I'd give luck a helping hand. The woman was too old to be useful, anyhow.

Peer's eyes were popping. He was waving his arms and gabbling like the old woman herself, as though his tongue were loose at both ends.

"Great tales are being told among our people," he said. "They say that the great frozen cold is coming down from the rim of the world, crushing everything in its path. It's higher even than Island Tor, and it stretches from one end of the world to the other. Nothing can live in its path, and

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nothing can travel fast enough to escape it. I'm to tell you you'd better see whether your coracle is able to float, and join the others below Great Falls. Then everybody will flee to safety!"

"Nonsense!" I said, even as I knew it was true (who could know better?) "That's just the mother-in-law talking!"

"One of these days you're going to say too much about my mother," began Kim, "and I'll take Peer and the coracle, and leave you here alone."

That's as far as she got, for suddenly all three of us were conscious that there was something new in the roaring that encompassed our lives. It came from the north. We raced to the top of the rock, Island Tor, and looked north along the bosom of the Father of Waters. And we beheld a tremendous sight.

That son of mine had brought back the truth! We couldn't yet see the wall of ice, but we could see the sun's reflection from it, and it was like a great curtain of gold, reaching from the limit of east to the limit of west, and into the blue dome which covered the world, as far as we could see, even when we squinted. It was beautiful beyond words—even my words, and I had many with which to describe beauty, words of my own invention, with which Kim's people had no patience. The ice was coming. Through the roaring of the Father of Waters we could hear it come. We could hear monstrous monoliths—which I knew from many explorations to be many times the size and height of Island Tor—being ripped up by the roots by the onrushing cold horror. I stared into the north, conscious for the first time that Island Tor was trembling!

MILES to the north, yet, and still the cold monster was shaking the earth, and shaking Island Tor. I began to be afraid.

But I had a solution. I would grab Kim and Peer and take them into the cave. I knew right where to look for the plast-iron from which I fashioned my sleeping mask. There was a big section of it, high on a wall of the cave.

"I'll fashion masks for each of you," I said. "Then we'll lie down, and waken away up in the past, thousands of thousands of times away, and escape the rushing mountains of weeping cold!"

Kim became very angry at that. She stamped her bare foot on the rocky top of Island Tor, and yelled at me:

"You've never listened to my mother, wise though you know her to be! But this time you're going to listen! If you won't take Peer and me to our people, in time, I'll take Peer and go without you!"

I was helpless, of course. There was, I knew when I started thinking more clearly, absolutely no way I could take Peer and Kim anywhere with me. For their destiny must work out its course if *I* were to work out *mine!*

I tried to explain it all to Kim, but she started screaming and getting red in the face, and I knew there was no use arguing with her.

"You're perfectly willing," she said, "to stay right here and let the white cold kill us all!"

"It will never kill you, "I said softly. "Or anyway, it won't kill Peer. For you can see *I'm* here, can't you?"

Of course she could, and she couldn't imagine what I was talking about—the "I" of 1938. It was useless to try to tell her. She already thought me mad. I'd have to take care not to turn my back, or go to sleep or she would bash out my brains and get away from Island Tor with Peer.

"This place," I said quietly, "is my home. Not even the white cold can destroy it. We can stay here and be safe forever, until we sleep for good. Regardless of what you say, I am not leaving Island Tor! Besides, I want to stay and see what happens."

I turned away from Kim and Peer, and strode to the north rim of Island Tor to watch the coming of the rampart of rushing white cold. And it was getting closer with unbelievable speed. Not even Kim's mother, crossing the muddy flood of the Father of Waters, when she was being caught in the suck of the Great Falls, traveled so swiftly.

I heard Kim scream from the lip of the crevasse.

I turned to see her holding Peer by

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the hand, urging him toward the crevasse and, I knew, the smaller cave where we kept our seldom used coracle. Peer was a strong little fellow, and didn't wish to leave me. His eyes were turned to the north, too, and I knew he wanted to stay with me and see what happened. His eyes didn't blink as he stared into the north, and his mother tugged at his arm.

THE roaring of the ice was majestic now. It drowned out even the roaring from Great Falls. I stared and stared. Behind me Peer yelled with excitement. There was no fear in that lad! The golden beams of the sun, reflected from the icy rampart I could not yet see, had become a vast world-rim-distant, sky-hung drapery of brilliant yellow as it approached.

Then I saw the first of the ice. So did Peer, for he screamed with high excitement. I knew what he saw, and that it would be imprinted on his mind, as well as on mine, indelibly, until we both died. Mother of us all, how swiftly it came! A world-wide monster of ice, it was, ploughing up the earth.

I saw it smash against a mountain to the north and hurl the whole mountain back over its own head, as a mammoth might have hurled a hunting dog. I saw the mountain settle, broken into its component parts, atop the rushing white cold, and the whole thing came right on, as though the added weight of the mountain were nothing.

Magnificent! Colossal! Stupendous! That toppling world of ice was a thing no words could describe. Moreover, its cold came on ahead of it, like an icy wall, and I began to feel chilled, very much afraid. I must not delay too long getting Kim and Peer away, or they would be lost!

I saw the rampart dig great canyons in the earth with its icy snout. I saw it fill them with ice. I saw it break off to fill those canyons and then saw other ice behind it slide across the abysses of its broken self. Island Tor rocked and shook.

I whirled on Kim and Peer.

"Get to the coracle!" I screamed. "Get away before ice overwhelms Island Tor! There isn't a moment to lose!"

Kim dragged Peer away. Peer kept looking back, not at me, but at the rushing rampart that, ploughing through the river above Island Tor, was rushing on our dwelling place.

Kim took Peer out of sight, into the crevasse. . . .

I wakened, covered with sweat, in Engineer City. I took off the mask and stared at it. It was the only proof I had of my experience, and now I had a complete name to suggest for it, that I would send to McKellar. Tempocycle-plast-iron! Or I might call it Gurda's mask, or even Haskell's mask or give McKellar the credit, by calling it McKellar's mask.

However, I was afraid of it, knowing whence it had come, and where more of the strange material could be found. That day, then, I took the mask with me to Grand Coulee Dam, and dropped it into a great batch of concrete that was going into the dam by which Columbia Basin — the land of Kim's people, and mine, of course—was to be reclaimed. Doing this, I shut off all possibility of going back and joining Peer, Kim and her folks in headlong flight from the rushing white rampart of the Ice Age—all memory of which had gone from my mind the instant Kim dragged Peer out of sight in the crevasse!

That, of course, was understandable; My "memory" was a racial one. Going into the crevasse, away from me, Peer had taken none of my subsequent experiences with him, so I could never find out how I had died.

But something tells me that out of sheer curiosity, I'll one day go back into the crevasse, back into the cave, and make myself another mask. And when I do, who knows what new wonders I shall find? In what stream of time I shall bathe again with my ancestors?

What's Your Science I.Q.? Test Yourself with the SCIENCE QUIZ on Page 62 of This Issue!

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SCIENTIFACTS

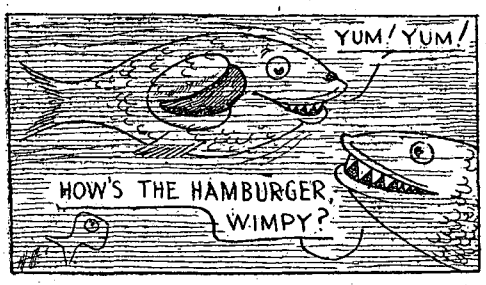
INCREDIBLE BUT TRUE

By J. B. WALTER

THE LIVING TEST-TUBE

NATURE'S own laboratory—the sea—offers scientists transparent animals for research!

Daphnia, favorite food for tropical fish, has recently leaped to fame as a testing medium for medicines. The glasslike transparency of this tiny fresh-water crustacean permits clear observation of the effects of medicinal



substances when they are dissolved in the water in which the Daphnia swims, or when they are injected into the creature's bloodstream.

Anesthetics, hypnotics, alkaloids and certain other toxins may be seen to act on the Daphnia heart, causing successive depressions of the beat, spasms, etc. One may observe the toxic effect being overcome by digitalis or related substances that affect the heart, in characteristic manner, as in higher animals.

The transparent Daphnia opens a new world for experimentation. It is possible to watch the action of poisons and their antidotes in various organs. The tiny creature furnishes a unique opportunity to study the intricate mechanism and balanced rhythm of life.

SPACE SHIPS ARE HERE

GET ready for a rocket trip to the moon!

The fanciful possibilities of transportation in the future are to be portrayed at the New York World's Fair by one of its own exhibits. This is a "rocket gun."

By a combination of movement, sound and light, there will be an adroit simulation of the arrival of passengers at a rocket port, their entry into a cabin-projectile, its emplacement in the gun, then the sudden and swift departure of the voyagers from the muzzle of the gun for Mars, the moon, or elsewhere in the cosmic beyond.

THE ETERNAL CLOCK

RADIUM is apparently the most perfect time-piece ever created!

The radio-active disintegration of radium goes on at a mathematical rate which is utterly independent of anything that man or nature can do.

Scientists may melt radium in the laboratory in the course of their experiments, compound it with other substances or subject it to any combination of temperatures and pressures; still it goes on unconcernedly and without change of pace to its doom. The rate of the radio-active disintegration remains exactly the same, at all times!

THE WORLD'S DEEPEST HOLE

MAN has penetrated beneath Earth's crust for almost three miles!

The deepest hole in the earth is a well of the Continental Oil Co., recently completed in the San Joaquin valley about four miles west of Wasco, Calif. It penetrated the earth's crust to a depth of 15,004 feet—almost three miles—a depth that exceeds by over 2,200 feet that of the previous record

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holder located in western Texas.

Temperature readings, taken under difficult conditions, indicated temperatures ranging from 196° F. at 6,000 feet to 268° at 15,000 feet, or 1 degree increase for every 125 ft. The further down you go, the hotter it gets.

TWENTY MILE LIMIT

HOW high will man go eventually?

Calculation shows that the airplane is not likely to go much above ten miles. The great stratosphere balloon, however, with its sealed gondola, is still far from having exhausted its possibilities. Auguste Piccard has an entirely new design for a large stratosphere balloon which is calculated to go to an altitude where the barometric pressure is only one hundredth of an atmosphere, 0.3 inches of mercury. This condition will be reached a little below twenty miles.

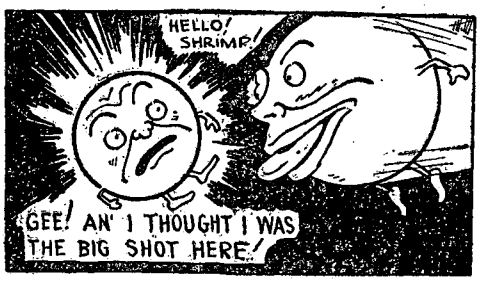
Above twenty miles stratosphere flying for humans will begin to be not only difficult—but dangerous.

THE SUN'S RIVAL

THE sun is *not* the largest member of the Solar System!

Comets are the largest members. The volume of a large comet may be greater than the volume of all the other members of the Solar System combined!

The tenuous tail of a giant comet could easily encompass the nine plan-

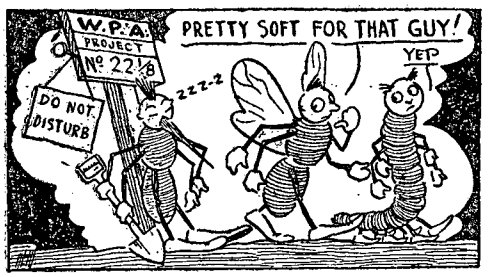


ets—and there'd be plenty of room left over to envelop the sun. For the incandescent tail is composed of millions of miles of cometary atmosphere.

TWO IN MILLIONS

THERE are millions of varieties of insects. But only two are profitable to man!

Over 300,000 species of insects have been described, yet only a small portion of the whole are known. Everywhere new species are being found,



and it has been estimated that the total number of distinct species runs into many millions.

Among all the millions of kinds of insects man has never found but two —the honey bee and the silkworm— which he could domesticate profitably. And although both have been kept and reared by man for countless ages, they have changed but very little from the original wild forms of these two busy species of insects.

THIS INCREDIBLE EARTH

IT IS said that parasites at one time were hard-working, self-supporting creatures who at some stage in the evolution of human forms, hundreds of millions of years ago, changed themselves around to live a life of ease and luxury at the expense of other creatures. . . . A photoelectric cell used with the 200-inch mirror being erected at Mount Wilson will be able to detect the light of a candle 3000 miles away. . . .

In deserts and upon the mountain tops the sun's rays can shatter solid rock, breaking it into fragments and covering the ground with an accumulation of rocky debris. This destruction is a consequence of the rapid heating of the rock, followed by rapid cooling through radiation after sunset. . . . Neither science nor nature has yet produced a black flower. The color of the widely publicized "black rose" is really deep red. . . . Ancient India ink came from the sepia gland product of the octopus. . . . A giant airplane engine of 1,500 horsepower uses approximately five tons of air for every hour of operation. . . .

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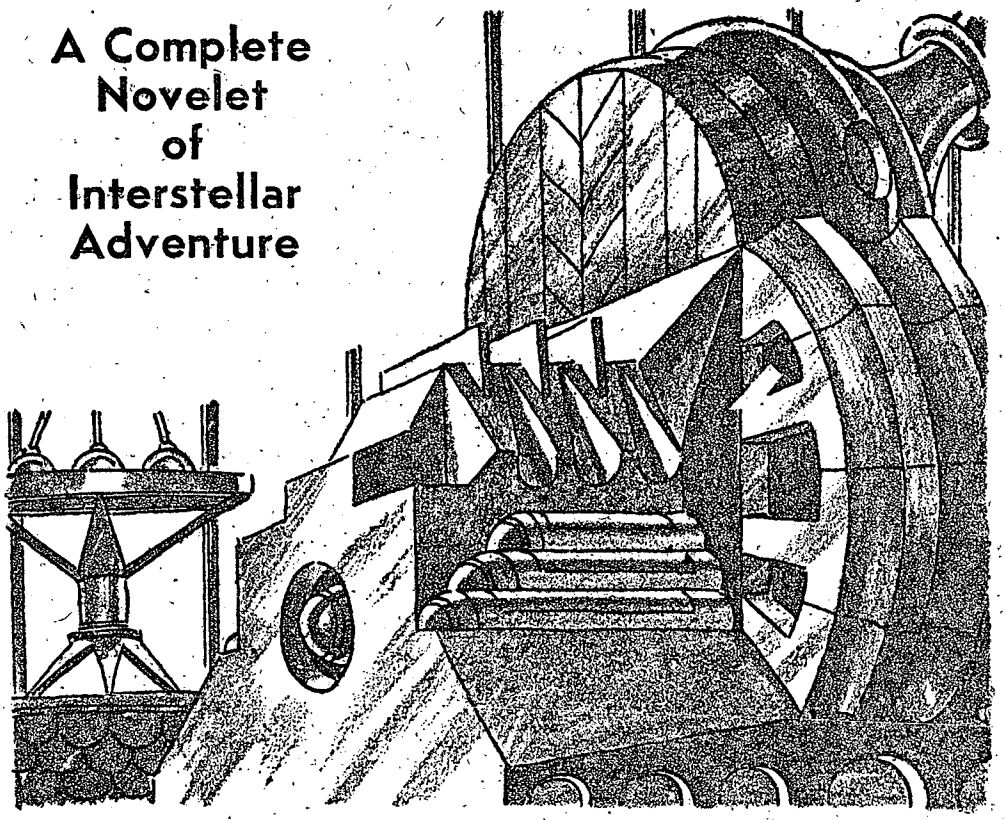
A Complete Novelet of Interstellar Adventure



A motionless, fantastic figure was seated before a control board

WORLD WITHOUT

CHAPTER I

Strange Planet

WHEN ARCHER LAKINGTON had set out from Earth in August, 2136, to search for new worlds or planetoids worthy of future prospection by the American Interplanetary Corporation, he had certainly not expected to roam through the deeps of space for six years.

Perhaps it was the uncanny fascination inseparable from the void that had driven him on. Perhaps it was the thought that he and his wife Joyce, bounded by the circumscribed limits of their space machine, were in a world all their own and unfettered by the idiocies and problems of a gigantic modern world.

Whatever the cause neither he nor his young wife were yet weary of their trip. During the six years they had sped far beyond Pluto into the outermost edges of the colossal Milky Way galaxy, were speeding now at the rate of 160,000 miles a second—the maximum rate that hovered on the very borders of dissolution by reason of the limiting power of the Fitzgerald Contraction.

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By POLTON CROSS

Author of "The Mental Ultimate," "Wings Across the Cosmos," etc.

CHANCE

Inside the ship neither of them was aware of the movement. They could only perceive it by their relation to the slowly moving points of the blazing stars. With floor gravitators to overcome the weightlessness of constant velocity they were able to move about in comfort in this little sphere that seemed destined to travel onwards for evermore.

"Six years and not a world worth bothering about," Lakington murmured, as he lounged at the outlook port. "Little worlds, big worlds—some with atmosphere like smelling salts and

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others as void as a vacuum trap."

He shrugged and smiled faintly. The rugged outlines of his face, seeming much older than his actual thirty years, were painted by the starshine. His broad, muscular shoulders loomed in silhouette against those dimensionless blazing points.

"So Archer Lakington will have to go back with a tale of failure!" he mused regretfully. "The guy who discovered the mulacite mines of Venus, the ravdon trees of Pluto, the—"

"Arch! Come here a minute!" The voice of his wife suddenly interrupted his soliloquy.

HE straightened up from his lounging position and moved over to the girl's stooping form. Her shock of honey-colored hair tumbled around her head as she peered fixedly into the spatial detector. From the very tensity of her slender, lightly-clad body he could sense that something unusual was absorbing her.

"You rang, madam?" he questioned lightly, as she remained rigid save for the movements of her capable fingers as they twirled the milled edge of the focusing wheel.

"Take a look," she ordered, standing erect. "Unless I'm going simple-minded through being locked up with you too long, I think there's a planet right ahead of us. Quite a respectable-looking planet too!"

"Planet?" He laughed indulgently as he saw the eagerness in her blue eyes. "A miracle like that hasn't happened in six years, so you decide to create one!"

He bent to the instrument to escape the wrath manifesting on her lovely face. Immediately the ultra powerful lenses of the detector revealed something that made him start in surprise—something that was beyond normal telescopic range and only impressed on the detector by the stepping up of faint light waves from immense distances.

Fixedly he studied a gray globe with belts of what were apparently clouds lying in ringed formation across it. It reminded him of a small-sized Uranus. He went on staring until his eyes ached, shifting the instrument gently until it was centrally fixed over the lined, transparent graph inside the lenses.

Finally he straightened up.

"Darned if you're not right!" he ejaculated in amazement. "Sorry, Joyce. It's a queer sort of planet, though—doesn't budge an eighth of an inch on the scale lines. There ought to be some kind of apparent motion—"

He broke off as he realized with some indignation that his wife was not listening. She had gone over to the untidy desk in the corner and was figuring laboriously.

"It's—er—roughly one thousand five hundred million miles distant," she proclaimed, waving her paper triumphantly. "Take us about two hours and a half to get there."

"Yeah—to find an atmosphere that even a Venusian squid fish wouldn't live in, I'll bet," he growled back. "For that matter we don't even know if it has an atmosphere. Those line formations may be surface markings and not clouds at all."

"I don't care what they are, we're going to look," she returned flatly. "It's a mystery world and that adds spice to the whole thing. Think of it! A planet that doesn't revolve, that hasn't even the slight apparent libration of Venus or Mercury. Nor is it because tidal drag has brought it to the end of its turning days because it has those clouds. Besides that it has a young and vigorous Sun."

Lakington nodded slowly and stroked his chin. "Guess you're right," he admitted. "It is a bit odd at that. Okay, we'll head that way."

He turned actively to the control board and changed the vessel's aimless hurtling into a direct course for the unknown world. Then he settled down to wait.

OUTSIDE, as the ship tore onward through the growing minutes, blazed the incomprehensible sentinels of the galaxy. Stars and Suns, perhaps even worlds beyond visibility, planetoids, cosmic dust—the whole vast agglomeration of infinity drawn on a scale calculated to stagger the mind.

Archer Lakington and his young wife gave less attention to spatial wonders now. Their attention was devoted

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to an analysis of the unknown world as it grew visibly in size in the instruments. Both of them felt their bewilderment deepen as the passing time revealed no change in its appearance.

It had not revolved in the slightest since the first observation, nor was it pursuing any orbit round its Sun—a typical G-type of dwarf star, from which it was distant approximately 100,000,000 miles. It seemed to be just one world alone, devoid even of neighboring planets.

"It's like trying to make equations without any knowledge of figures," Lakington growled, after making futile efforts to arrive at mathematical postulations. "Only thing to do is to wait until we get there."

"Such genius!" Joyce murmured. She had forsaken the instruments and was lounging on the wall bed. "I could have told you that an hour ago, only I like to watch you work for a change."

She locked her hands behind her yellow head and smiled. Finally she laughed aloud.

"Ha-ha," Lakington mimicked sourly. "What's so funny, Mrs. Lakington?"

"That planet!" she drawled. "Just suppose it's a spatial mirage? We've encountered them before, remember. It may be a phantom reassemblation of light waves which departed into Einstein's unbounded space millions of ages ago. Our instrument may merely have intersected the convergence of the light images."

"In that case it wouldn't be a world with clouds," he returned with a little asperity. "It would be a mere hulk, the reflection of a dead world that cracked up—according to Eddington's figures—nearly six thousand six hundred million years ago. And anyhow such a supposition isn't so funny."

"But it would be if you returned to Earth and handed old President Bentley a bunch of nothing to colonize! I can just picture his face."

"Never mind his face. It gives me a pain anyway. Quit lounging about and check up our distance. How much further have we to go?"

She slid dutifully from the bed and checked up.

"Be there in about another sixty-four minutes. Then you can stick a flag right in the middle of emptiness."

"Seriously, Joyce, you don't think we are chasing a myth, do you?" he asked anxiously, and she shrugged.

"How should I know? I've done plenty of speculating, though, and I can't see what else that planet can be. Every planet must conform to certain known laws, and this one doesn't obey one of them! I don't have to tell you that mighty queer things can happen in space. Not only can we have mirages by light wave quirks, but we can also have delusions by reason of unknown thought waves affecting our brains from sources unknown."

"GRANTING the presence of brains," he murmured acidly. "Truth is you want an excuse to run away. Just plain scared now we're getting near."

"Scared!" she flared. "Why, you—" Then she stopped and relaxed as he suddenly reached over and his arms went about her tightly.

"Like all women in space your brain is about as empty," he murmured, kissing her. "Still, I guess I can stand you at that. . . . Now stop making love to me, will you? Don't you know there's work to do?"

He released her slender body and turned back to the control board, fingering the switches purposefully. From that moment onward both he and his wife became mechanized units in a plan of action, all irrelevancies thrust aside in the management of the ship as it came at last within measurable distance of the strange planet.

It hung directly ahead now. Level cloud belts gathered round it, bathed in the sulphur-yellow light of the Sun.

Lakington studied it for a moment through the window, then gave full power to the softly humming engines that had been guiding the course. Immediately the rocket tubes flared violently and began to slow the vessel down in tremendous jolts and thrusts, bringing the two passengers into direct acquaintance with the sickening laws of inertia.

"That's no myth!" Lakington muttered, his gray eyes fixed on the queer world. "It's as solid as this ship. Give

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your left forward tube a bit more power, Joyce. . . . That's it!"

CHAPTER II

Trees Turn to Ash

ROCKET discharges spurting powerfully, the ship curved round in a gigantic arc and went sweeping downward to the vast gray concavity directly below. Down and down, slackening and dragging with the flying seconds, clean into the midst of the clouds.

The instant that happened Archer Lakington's expression changed from satisfaction to alarm. Usually he relied upon atmosphere to help cushion the ship's fall, but this time he met no resistance whatever! The air was as resistless as the void itself.

Swearing fervently, he gave the forward rocket tubes the limit. The ship flattened out under terrific strain, just in time to skim the needle summits of a high mountain range.

"Gosh!" Joyce whispered, drawing a long breath and dabbing at her damp brow. "What are you trying to do? Endanger my life?"

"Why not?" he asked, and grinned at her maliciously. Then he studied his meters and gauges.

"Something screwy around here. . . . Well, what do you know about that?" he finished blankly, staring through the window as the ship finally burst free of the clouds and began to drop gently to the landscape below.

Joyce gazed with him, a vaguely bewildered expression on her cameolike features. She, too, could detect something peculiarly different about this world—a curiously immovable appearance as though it were a still life photograph given the advantage of a third dimension.

"No wind—no movement—no anything," she almost whispered, as the vessel came gently to rest on a long undulating plain of substance resembling earthly moss. "Just one big immovable landscape."

Lakington rose from his control chair and stood with lips compressed, looking over her shoulder. His gray eyes took in the moss plain and, bordering it, an immense and motionless jungle that somehow reminded him of Earth's Carboniferous age. Beyond the jungle reared the tremendous mountain chain with which he had nearly collided.

In the opposite direction the moss plain extended to horizon limit—vast and empty. Overhead were the unmoving clouds, as frozen into inactivity as though they were indeed part of a photograph.

"Are we wrong or is the landscape?" Joyce finally questioned, turning. "Did you ever see a planet so nicely ready for somebody to walk into?" She finished dubiously: "Or out of?"

Lakington looked at his external registers and gave a low whistle of amazement.

"Is everything screwy around here?" he asked helplessly. "Temperature, air pressure, humidity—all of them register zero! That just can't be! The clouds alone prove water vapor and atmosphere. The moss proves life. What sort of a planet *is* this?"

Struck with a sudden thought, Joyce reached out her hand and broke the current for the floor gravitating plates. The fact that she had done so was hardly noticeable.

"There you are!" she exclaimed. "The gravitation is okay, anyhow—about the same as Earth's. In fact the entire planet isn't altogether unlike Earth at that. . . . We're going outside!"

SHE gave her ultimatum with decision, and headed for the closet where the space suits were kept. Handing one to her puzzled husband, she began to scramble into her own, and screwed her helmet in place. Automatically the air cylinder on her back began to function. Then she disappeared into the storeroom and returned with a space-proof haversack of tabloid food and drink slung over her shoulder.

"Ready?" Her voice came clearly through the helmet phones.

Lakington nodded, fingering his atomic energy gun. Turning to the airlock, he twisted the massive screws and swung the immensely thick cover inward.

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"Looks all right," was his comment, as he contemplated the landscape through his face glass.

"Appearances may be deceptive," Joyce reminded him. "Even though things looks all set for a garden party we're safer inside space suits to begin with. Let's get going."

She set the example by stepping onto the mosslike ground with her thick boots. Almost immediately she stopped and stood looking down in bewilderment at the ashen gray prints she left behind. It was as though she had walked in powdered snow.

"Looks as though the moss is crystallized or something," she said in a tone of wonder. "Any suggestions, master mind?"

"None yet," her husband replied, straightening up from studying the phenomenon. "We'll keep on going for a bit. Incidentally, if I'm not too curious, where are we heading?"

"The jungle, of course." She waved a bloated arm toward it. "Unless you prefer to hitch-hike across the moss plain instead. It's up to you."

He ignored her sarcasm and plodded along in silence beside her, trying to form some sane line of reasoning in his mind. Beyond all doubt this world was literally standing still. It had no axial revolution and no orbital revolution nor, according to the instruments, had it any air pressure. That point, at least, was visibly disproved by the banked clouds; either the instruments were cockeyed or else—

He shook his head inside his helmet in exasperated perplexity and followed Joyce as she gained the first outpost of the jungle.

After proceeding for a few yards within it she suddenly stopped and looked closely at one specimen of the towering trees around them. Jerking an instrument like a voltmeter from her belt she started to jab the needle-pointed end into the trunk. To her consternation, the entire tree collapsed in a cloud of fine ash and smothered her completely.

She emerged from the midst of the setting fog to find her husband doubled up in suppressed mirth.

"Great!" he gasped. "Absolutely great, Joyce! Do it again. I didn't get a good look the first time."

"Never mind the cracks," she returned sourly. "Suppose you bring your supercharged brain to bear on the problem of why an entire tree should collapse like that? I was going to test its temperature. I only just touched it, and—"

"I know," he said, becoming serious again, "but even if you could have taken its temperature you'd have found your instrument as haywire as those in the ship. Nothing here registers one way or the other. Seems to be in a state of flat in-between."

HIS head bent back inside the glass helmet as his eyes looked up the length of the neighboring trees with their lacy but oddly stiff-looking foliage. Broad spatulate leaves graced all the branches, but they were totally without motion. That in itself was almost unbelievable, for there must certainly be air to produce clouds, and even the stillest air has some slight vibration. Everything seemed to be one vast contradiction.

The undergrowth was the same when he came to look at it, except where he and Joyce had trodden. There he found a zigzag path of ash gray where roots and twisted creepers had fallen to infinitesimal pieces as though they had been saturated in liquid air and then dropped.

"Crystallization?" he asked, in a harassed voice. "No, that couldn't happen. Frost? Hardly, with sunshine behind those clouds I'm damned if I know! Push on a bit further, Joyce."

They resumed their steady progress, pushing their way through growing density that snapped into inconceivably fine powder at their clumsy approach. At least there was no necessity for them to blaze a trail. It stretched in a line of crumbled ruin to their rear.

"Do you think it possible that elements here might have evolved in a totally different fashion to anything we understand?" Joyce asked presently, thinking hard. "Isn't it possible that if they pursued an evolutionary line—"

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"No evolutionary line can explain a planet that doesn't revolve and has motionless clouds," Lukington returned irritably. "If only we could find some sign of people, or—"

"Oh, Arch! Look!" Joyce stopped so suddenly that he bumped into her.

Instantly he followed the line of her pointing glove and stared in amazement at a veritable monstrosity. In an uncritical mood he might have called the thing a toad, magnified about fifty times. It was squatting in gigantic immobility in the very midst of a heap of brittle grass, a thing of stone gray with its wide saucer eyes staring unseeingly.

"Life!" Lakington breathed, his eyes gleaming. "Pretty tough-looking sort of brute, but life just the same."

"Life, my eye!" Joyce said acidly. "The thing's as crystallized as the rest of the stuff. Look!"

She reached forth her hand and touched it. Instantly it was gray dust.

"You yellow-headed dimwit!" Lakington yelped exasperatedly. "I was going to take that back to the ship as a specimen. How do you expect us to start an analysis if you break everything up around here?"

"Hasn't it occurred to you that you couldn't carry a thing like that for two miles?" she challenged hotly. "Even a touch finished it. Besides, I've better things to do than watch you do an egg and spoon race back to the ship."

SHE swung round and stalked off indignantly. With a grin, Archer Lakington followed her. For a long time they twined in and out of the peculiar loveliness, all the time with fast deepening bewilderment. The span of an hour brought them to a clearer space, leading upward to a small hill where the jungle entirely disappeared.

"Keep going," Lakington counseled, answering his wife's inquiring look. "If there's nothing there we'll turn back."

He began to follow her, then gave a grunt of irritation as he stumbled over a piece of rising ground. The slip dislodged his atomic gun from his hand. Mechanically he stooped to pick it up, but long before the action was complete the gun flew back into his open hand with perfect precision! Mechanically his fingers closed over it.

"What the—" he began dazedly. Then he swung round and charged after the girl before their interconnecting helmet phone wires were snapped by distance.

"Hey, Joyce! Joyce! Wait a minute! Look here!"

CHAPTER III

Random Element

LAKINGTON flung down the gun as he ran. It hit the ground in a puff of ash and rebounded back in a line, dead centered on his palm.

"Now what?" she asked tartly, halting. "Nothing better to do than play ball?"

"This is my *gun!*" he shouted, drawing level with her so she could see it. "If I throw it down it rebounds to the point of origin with exactly the same speed as the throw. The ground isn't resilient, either. Anything but."

"But—but that's impossible!" she protested.

"I know that, but it happens all the same. What does it imply? Quick! Help me think."

Joyce did think—and quickly. "It proves that the gun retains both the energy and organization of energy of the original fall," she swiftly decided. "Normally the kinetic energy of the gun should have been converted into heat-energy. Its molecules would move downward with equal and parallel velocities until it struck the ground, when they would be completely disorganized."

"And they weren't!" he cried excitedly. "They weren't! There was no disorganization. Somehow the gun must have got hold of an extraneous energy which lifted it back to the same place—"

"Or else there was actually perfect organization all the time!" Joyce put

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in quickly. She fell to thinking again, then laid her gloved hand on his arm. "Listen, Arch, it looks as though we've blundered into a whole lot of mystery. Suppose by some incredible freak this planet has achieved a perfect organization? It would mean no progress or retrogression, because Time would be a zero quantity where organization is at a complete equilibrium. The possible shuffling of molecules and atoms is at maximum efficiency. There is no random element!"

"No random element," he repeated slowly. "That means that nothing can ever happen. But why? How the Sam Hill did the planet get that way anyhow? What about gravitation?"

"Gravitation is something we don't know much about—nor does anybody else either," she reminded him. "It might be a warp or a farce, all depending on the way one views it. It's quite possible that it would be a thing apart from organized equilibrium."

"And the sunlight behind those clouds? That involves the action of light waves?"

"Unless they are the same light waves that were in existence when this world got this way. In that case they, too, would be incapable of exhaustion, and also incapable of increase. The result is just—well, plain daylight. The more I think of it, Arch, the more sure I am that we've struck the most amazing planet in creation. One where there actually is no random element."

"We'll figure this out on the ship," he decided promptly. "We'll see if there's anything over the hill, then head back."

They resumed the climb and gained the hilltop in the space of a few minutes. Once there they stood gazing down on the amazing sight of a deserted city, stone gray as was everything else, but conveying the suggestion of once having reached inconceivable scientific attainment.

ITS area was probably nearly forty square miles, reaching clear to the horizon on all sides. In appearance it was almost like that of Earth, save that it was far in advance of even the colossal futurist cities of Earth, 2136. The main impression seemed to be one of square towers reaching to the unmoving clouds; towers that were studded with windows and braced by slender bridges. The streets were canyons, laid out in perfect order and symmetry, groups of four running into a broad and cleverly planned square poised over what were obviously far-reaching subway systems.

"Dead — quite dead!" Lakington muttered at last, drawing a deep breath from his air cylinder. "Science down there far beyond anything we ever knew, I expect, and we had to come too late!"

"Suppose you stop being dramatic and come with me and find out if you're right?" Joyce suggested crisply. "We might find a clue if nothing else. How about it?"

"Of course. If you're not tired?"

"Active bodies never get tired," she returned in a tone of mocking challenge.

She set off boldly down the brittle moss defile, slipping ever and again, until caution against the possibility of ripping her space suit forced her into a crawl. Her husband was right beside her.

Only once on the descent did they stop to consume a few of their food and water tabloids, thrusting them through the special vacuum traps in helmets and haversack. Then again they were on their way. Two hours more, and they gained the first broad street of the strange metropolis and stood regarding its enormity in perplexity.

"This is going to present some difficulty," Lakington murmured, nodding back to the roadway. "Wherever we touch anything we leave this ashy deposit. Look at the apparently solid stone behind us." He pointed to the trail of footmarks. "If we go inside a building it might come down on top of us! Like your tree."

"But that idea's not so good," Joyce observed thoughtfully. "No reason why a complete building should come down unless we deliberately push it. Walking along its floor should be fairly safe." She hesitated a moment. "There's something else I've been considering, too," she said slowly. "If we

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are actually on a planet that's achieved organization doesn't it occur to you that we represent a random element ourselves. Maybe that's why we make such a mess everywhere we go."

"Maybe you're right." He shrugged. "Still, we've no time to worry over that now. We've started this thing, and we may as well finish it. Watch your step when we get right into the city."

They advanced again, leaving that long trail of ashy substance in their wake. At length they gained the central square with its bordering edifices. Curiously enough, many of the great doors were wide open, but there seemed to be no trace of inhabitants. Only the empty vista of streets leading beyond the square; only the stationary clouds bunched overhead.

Archer Lakington stopped before a promising-looking building and stared into the interior at a dimly visible mass of machinery.

"We'll chance going in," he announced, and with Joyce by his side began to ascend the steps. The imprints of crumbling dust still followed them.

ONCE within the enormity of hall they stood looking around. There was no trace of dust. The daylight was bright through the mighty floor-length windows, revealing a wilderness of incomprehensible machines of the stone-gray color. In rapt attention, Archer Lakington left his wife and began to wander round, taking good care to keep his distance from the machines in case the slightest tremor from him should send them trumbling into ruin.

"Whoever put these together sure knew all the answers," he said thoughtfully, as Joyce caught up with him. "I can't figure out a third of it. Transformers are here, condensers and armatures of an advanced design, but the rest of the stuff has got me licked. I should imagine—"

He stopped abruptly as they came around the corner of a gigantic engine that looked like an overgrown dynamo. He felt Joyce's gloved hand tighten on his arm as she, too, saw what was focusing his gaze—a motionless, fantastic figure seated before a control board in the very heart of the machinery.

"Take it easy this time," he cautioned. "Leave your meddling for less interesting things."

Joyce was too absorbed to think of a retort. With careful footsteps they moved to within two feet of the creature and stood perplexedly regarding it.

It had little parallel to anything they knew, unless it was perhaps an upright alligator with greatly extended forepaws. The back was scaly and the belly smooth. Legs were only brief and ended in appendages remarkably like sea flippers. Similar curious extremities rested gently on the multiple banks of switches comprising the control board.

Leaning farther sideward, it was just possible for the pair to see the face—almost fishlike, with large eyes, no nose, and a tight, set scar that was probably a mouth. The eyes were the most remarkable, faceted like diamonds, and uncannily inhuman.

"Nice little playmate," Joyce muttered, with a shudder, after a breathless space. "Wonder if it was ever intelligent?"

He snorted expressively.

"What do you mean, intelligent? Of course it was intelligent! How else could it understand a switchboard like that? Probably had far more brains than you and I put together." He groaned helplessly. "Hell, if only it could speak! This is like being stuck in a wax museum."

"You'll be making me homesick next," she retorted tartly, "and here are we stuck amongst a lot of junk that doesn't make sense, with a frost-bound alligator seated one day at the organ. I'm getting fed up with this!"

"Not so fed up as tired, probably." Lakington smiled inside his glass. "Tell you what we'll do! We'll have one more nose around the other buildings and then come back here and have a rest—if you can rest in a place like this. How's that?"

"Check."

She nodded, and they retraced their crumbled footprints to the exterior and started another investigation.

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CHAPTER IV

The Experiment

IN the time they allotted themselves they only managed to add to their perplexity. They found further infinities of machinery, obviously all remotely controlled from the first edifice they had entered. Other buildings were apparently offices and domiciles, equipped with all manner of odd furniture to suit the queer inhabitants.

Most remarkable of all was one gigantic place filled from wall to wall with thousands of beings, like the one they had seen in the control room, all frozen into one solid mass in various postures, their unseeing, faceted eyes gazing at a solitary alligator at the far end of the hall. Since it was impossible to reach him without smashing the jammed beings to dust the two investigators reluctantly turned away and went back to the first edifice. They squatted down on the floor near that main switchboard, fervently wishing it were possible to remove their hot and cumbersome space suits.

"It looks to me as though some experiment brought about this mess," Archer Lakington murmured presently, his abstracted eyes traveling once again to the motionless machine controller. "Maybe some experiment in matter that brought about the elimination of a random element. It's a hard fact to credit that a world might exist without it, without entropy, where everything *is*, and never *becomes*. Yet in cold fact it is just as possible as a world where the random element does exist."

"Like the pack of cards from the maker which you shuffle once and can only shuffle into the primary order by a coincidence?" Joyce questioned with a yawn. "Gosh, I'm sleepy!"

"Like that, yes. The more you shuffle, the worse the disorganization; and the more things you shuffle, the greater the disorganization. Only a complete state cannot be shuffled. It is free of the random element. If we suppose that these alligator gentlemen found a way to weld their entire planet and all it contained into one absolute state it would destroy the random element. It would be like taking the king of spades out of the card pack and trying to shuffle it alone."

Joyce's weary face brightened momentarily behind the shield of sonium glass.

"After all, that isn't so impossible as it sounds!" she exclaimed. "The quantum laws admit of the emission of certain kinds and quantities of light from an atom, and they also admit of absorption of the same kinds and quantities, the undoing of the emission. That very process defies a random element, but in losing the random element it gains something far more complex—the loss of future and past time, because a certain sequence of events running from past to future is the *doing* of an event and the same sequence running from future to past is the *undoing* of it.

"That infers there is no time at all. The laws of Nature are indifferent as to the doing or undoing of an event, so they must be just as indifferent as to a direction of time from past to future."

"Mathematically correct," Lakington admiringly confirmed. "Left is minus x, right is plus x; past is minus t, future is plus t. What more do you want? And it holds good for all single units, but is at once destroyed when one achieves a composite."

HE fell silent, brooding, his eyes on the incomprehensible machinery.

"Yes, I think we've hit it," he averred after a while. "The behavior of my gun, the absolute timelessness of this world. Perfect organization has been achieved, either by accident or design. I don't suppose we'll ever know. Say, has it ever occurred to you that absolute organization of molecules can be shown in poetry? Listen:

> The famous Duke of York
> With twenty thousand men,
> He marched them up to the top
> of the hill
> And marched them down again.

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"So what?" Joyce questioned sleepily, curling up in the ashy hole her body had made in the floor. "I'm going to take a nap. You can recite poetry. Why not try Humpty Dumpty? He was the exact opposite of the Duke of York. Disorganization plus! Remember the stuff about all the king's horses and all the king's men that couldn't put him together again? Random element entered into Humpty—and how!"

She was asleep before she could answer him. He smiled down at her, then with a sigh at his own peculiar lassitude he lay down beside her, allowing his drowsy mind to play over the incredible things they had discovered together.

But long before he could formulate a reason for the organized planet he had fallen dead aslep.

To be conscious of the fact that he had fallen asleep was something Lakington could not understand. Where he should have encountered oblivion or hazy indeterminate dreams he found instead that he was in a profoundly complex condition of sleeping wakefulness.

His brain was remarkably alert and keen, yet it was no longer controlling his body. An inner conviction assured him that he was fast asleep, or else in a curious state wherein his bodily reactions had no power. He vaguely wondered if Joyce was undergoing the same experience. He could not see her—could, in fact, see only a blank wall of darkness. Nor could any effort of will break it down. His body was no longer under control.

"Have no fear. You will not be harmed."

His brain jolted at the sudden inception of that sentence. It was not spoken, for his ears were useless by reason of the all-enclosing helmet. Neither was it Joyce who had spoken. Vaguely he realized that it must be the pure essence of thought, in sympathy with his own mentality.

"I am the being at the switchboard," the communicator suddenly resumed. "By some indeterminate chance you and your mate have come out of the cosmos to this world to release us from a bondage of our own foolish making. You have not gone to sleep in the fashion you call sleep; rather you have succumbed to my stronger mentality which has temporarily deprived you of the use of your bodies. Only in that state, with your minds dissociated from the mastery of your physical selves, am I able to communicate with you."

THERE was silence for a space and Lakington yearned, with a helpless desperation, to ask the questions surging into his mind. Then suddenly the being resumed.

"My name is Ixal, so far as I can transcribe it into your language. Before this experiment I was the leading scientist of our people. We numbered five hundred thousand, all of us the last of our race which had formerly occupied other planets in this system. Those other planets have died away. Even the Sun they possessed has ceased to be, and another one has come into being.

"The course of our experiments took us into the study of entropy, probability of electrons, and disorganization. We reasoned that by a process of molecular selection we could force our world and all it contained into a state of perfect organization, thereby defeating the primary and secondary laws of Nature and bringing into being a state of perfect thermodynamic equilibrium.

"We achieved this state by working from the basis that energy is not infinitely divisible, or at least not infinitely divided in the process of shuffling. This involved a completely new science of physics, including what you term the quantum laws, which admit of the reversibility of varied radiations from an atom back to the point of origin.

"We began to study the major stars of our galaxy and determined that their interiors were in a condition of perfect thermo-dynamic equilibrium. The energy within them was shuffled as it was radiated from matter into ether and back again, so that the possibility of shuffling soon attained maximum limit.

"Every change had been made and perfect organization achieved—but

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there were certain laws that governed that process, laws relating to atoms and molecules which are the prime basis of all disorganization. If there were not such laws, perfect balance could never be achieved.

"The same laws that produce disorganization can be reversed to produce the opposite effect. A flying object striking another object can, by the government of electro-dynamic laws, be made to retain its original kinetic energy and return to its starting point without conversion into heat energy. This fact we proved for ourselves with the instruments we constructed. Thus we built up our science of molecular and atomic organization—a science basically implying that one law can be made to govern another and eliminate the random element from matter and energy.

"Unfortunately, however, though our experiments were perfect, though our machines definitely brought into being the electrical laws governing the organization of energy, we omitted to reckon in our eagerness that perfect organization cancels the law of Time. This will be clear to you, because increase of a random element indicates the future; more organization indicates the past—but perfect organization without increase or decrease achieves the state of balanced non-entropy, no time."

IXAL'S thoughts saddened a trifle as he went on.

"We were all eager to test out the idea on a large scale. We became the slaves of a scientific obsession, built larger and larger machines capable of bringing organization to bear on all parts of our planet. We arranged a day when the machine should be loosed. My fellows congregated in the main hall of science to listen to our ruler's preliminary speech. I took up my position at the master control board here and waited for the signal. When it came I released the engines.

"Since then, millions of years ago, I have never moved. Nor have my fellows. In that instant we came to a dead standstill, neither living nor dying, in a state of perfect timeless equilibrium. Our minds have lived on because mind is not a thing of molecules and atoms, but one sector of an inconceivable pattern of mentality in space.

"Our world could not crumble, could not change, could not revolve; could not do anything but stay exactly as we placed it in that instant of organization. Only by the coming of a random element could we find release.

"You, my friends, have brought us that release. You have introduced the first random element in nearly twenty millions of years. With every second the shuffling will increase. It started from the instant your space machine entered our atmosphere. Time will catch up with itself and our world and all it contains will cease to be. Be warned of that fact. Leave it immediately!"

CHAPTER V

Return of Chance

ARCHER LAKINGTON stirred with sudden uneasiness and jolted his eyes open in abrupt bewilderment to survey the great mass of the machine hall. As he sat up in the deepening hole where his body lay, his mind was still swirling with vivid memories of the things he had been told.

"Did I hear that, or dream it?" he muttered, regarding the motionless alligator man in deep perplexity.

"You don't imagine a limited mind like yours could dream a technical thing like that, do you?"

He twisted round to find Joyce looking at him. Her heated face behind its glass helmet was half serious and half amused. She slowly began to nod.

"We both heard it," she confirmed. "The alligator talked to me as well as to you." She went on reflectively. "Funny, isn't it? Two boneheads like us from an incredibly far-off world drop in here and provide the key to a prison that's had these infinitely brilliant people locked up for twenty million years!"

"Which reminds me!" Lakington

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interrupted, scrambling to his feet. "He told us to get out of here in double-quick time. Let's get moving."

They cast one last envious, half perplexed look at the vast machinery, tribute to a science that had defeated its own ends, and then crept silently out into the ashy street.

The moment they reached the top of the steps they stood transfixed in consternation, overwhelmed at the sight that met their eyes. Something had happened—something that unimaginably changed the outlook!

In all directions the gigantic buildings were crumbling and collapsing in clouds of ashen gray, like objects flawlessly patterned in dust suddenly blown by a mighty wind. Overhead the clouds were no longer motionless, but writhing and boiling as strange hurricane drafts tore through them and gave glimpses of the blazing Sun beyond.

"Arch, what—what's happened?" Joyce faltered nervously, and that second all her self-sufficiency collapsed. She was a pale, frightened girl clinging to the rubbered arm of her equally perplexed husband.

"It looks like an earthquake, but it isn't," he answered her grimly. "It's something we can't understand—that damned random element old Ixal was talking about. What fools we were not to turn back when we had our theory all doped out, instead of coming on here! It's our own intrusion that's caused it. Our breaking through the forest, our footsteps on the ground—everything. We started a process that leads right to extinction." He grasped her arm tightly. "We've got to step on it, Joyce, if we're to reach the ship. Come on!"

They went down the steps three at a time, steps that crumbled and rotted away into impalpable powder as they trod them. The buildings around them slewed and shifted crazily, fell into absurd and unbelievable nothing as their long inert state was shattered utterly by the return of the law of chance.

THE farther the two went, panting hard for breath in the restricted area of their space suits, the more they realized the desperate struggle ahead of them. Even as they ran they dropped knee deep in ground that was no longer ground but a whirling, spreading enigma of emptiness fast losing all relation to material law.

Solidity and organization had gone forever. The crazy, timeless world was catching up on itself with ever-increasing speed as the random element became eternally faster by very reason of the growing variety of atomic shufflings.

Beyond the end of the road they slid to a baffled, horrified halt. The little hill they had come down was no longer there! It had collapsed to form what was now a crumbling, level plain in the midst of which there frothed and boiled and flew the dusty phantasmal creations that had formerly been trees and undergrowth.

"The ship!" Joyce panted hysterically. "Arch, the ship! We can't possibly reach it! It's several miles away. What in Heaven's name are we going to do?"

"How should I know?" He looked around helplessly, then staggered forward as the ground underneath him suddenly began to collapse. Instantly his young wife grabbed him and drew him back, stumbled forward again with him.

"Have to keep going," he gasped. "Either we'll give in or else the planet will! We've got to take the chance!"

Arms locked round one another they blundered onward, buffeted now by an insensate hurricane that suddenly sprang from nowhere as the molecules of the atmosphere underwent mad and inexplicable transformations, flew into new paths. Cyclone, rain, raging tumult battered and hammered them with overwhelming force, forced them to stagger blindly forward, hardly able to see through the drenching cataracts streaming down their glass helmets.

"A—a swell planet this would be to colonize!" Lakington choked, floundering waist-deep in the midst of rolling water and mud. "Hell! It's worse than a Venusian backdraft!"

"Unless I miss my guess we check out here," Joyce whimpered weakly. "We can't make the ship, Arch, and

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you know it!"

She swooshed from the midst of the water and halted momentarily on the crumbling ground, bracing herself against the raging wind. When Lakington looked at her, her face was hardly visible through the dirt and ashy substance plastered to the glass of her helmet.

"What do you—" she began, then ended with a wild, desperate cry as the trembling ground under her feet parted abruptly into a yawning, gaping abyss.

She did not stand a chance. One minute she was swaying and trying to speak; the next, she vanished utterly in the boiling smother of the chasm. With the sudden tug on the helmet communication cord Archer Lakington found himself slammed forcibly down on the chasm edge. The cord parted with a snap and left him staring in dumb, blank misery at copper wire swaying wildly in the half light.

"Joyce!" he screamed frantically, and his voice dinned inside his helmet. "Joyce! Oh, my God!"

SWEAT poured down his face in the agony of those seconds. He lay staring down into the frightful gulf, at the tottering walls of it beyond. Everything was swinging and twisting insanely. Joyce had gone! That was the only thought in his tortured brain—his wife was gone beyond recall!

"Joyce!" he choked, trying to form some kind of rescue plan in his stunned mind.

Then even as he lay there the ground, under his sprawling form, ceased to be and he was pitched helplessly forward into the depths. For breathless seconds he fell with sickening speed, heart and brain struggling madly to cope with the frightful drop. Then to his surprise his speed began to slacken. The misty vaporings that had been remote chasm sides receded and puffed into nothing.

The wet and dirt on his face shield cleared somewhat, the former turning into visible frost and then vanishing entirely as water vapor expired. He was dimly aware that he was slowly revolving, blinded by the light of a mighty Sun below him.

Shielding his tortured eyes as best he could he stared in bewilderment at his surroundings. He was in space! Slowly drifting toward the immensely powerful gravitational field of that blazing star. All traces of the strange, timeless world had disappeared. Nothing was left but the void and stars.

The thought of Joyce stabbed back into his aching mind. He tried to twist around but only succeeded in drifting crazily and without direction. But in the action he did glimpse the bloated figure of his young wife drifting in the emptiness, and further beyond her the space machine itself gleaming brightly in the sunshine.

The sudden desperation of the predicament forced itself upon him. Joyce, separated from him by a good mile of void, was not making the slightest movement. For all he knew to the contrary she might be dead. The ship was easily three miles away, moving with swifter speed toward the Sun's gravitational field by reason of its greater mass.

Lakington did not need to realize that there is no foothold in space. His helpless efforts to reach Joyce only sent him turning in circles and parabolas, left him staring through half-closed eyes at the writhing prominences curling from the insufferable globe below.

Desperate with anxiety he clutched himself tightly in readiness to try again. Then he paused in the action as his gloved hand smote upon the hard outline of his atomic gun in its belt holster. For a moment he fingered it, a thought turning over in his mind. Then he snatched it out and leveled it at his feet, taking care that the beam did not actually strike him.

Savagely he pressed the release button and, as he had wildly hoped, the stunt worked. The terrific backward recoil hurled him with the exact equivalent of energy in the opposite direction, straight toward his wife. Again he pressed—and again. He cannoned into her softly floating form and flung an arm around her belted waist.

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FEAR began to grip him again at the smallness of the leaps under the added mass of her body, yet he dared not release her and work alone as yet, because of the fast-increasing power of the Sun. He had three miles to cover and twelve more charges left in the gun.

Setting his teeth, he fired again and again, correcting his course each time. The eleventh charge found him within two hundred feet of the vessel drifting toward the Sun. There was nothing for it but to finish solo. Instantly he cast Joyce adrift and fired for the last time, catapulted forward just far enough to grip the edges of the manhole opening.

Within moments he was inside the vessel and had leaped to the control board, set the rockets blazing fiercely in a pull against the Sun.

The rest was easy. In a few minutes he had dragged Joyce inside and closed the airlock, switched on the gravitators and got the air plant to work. . . .

"I thought I'd managed to get rid of my yellow-headed distraction for good," he told her briefly, when they were seated together an hour later, eating a much needed meal. "Evidently the fall into the chasm did you no more harm than it did me. Pretty obvious that that world just cracked up into nothing and reverted to where it should have been ages ago. You and I and the space ship were the only solid things left."

"I'll never get over being childish enough to faint," Joyce mourned in self-condemnation. "Must have been the shock. That atomic gun idea was pretty smart, though."

"Thanks!" He leaned over and kissed her, then went on eating. When he looked up again it was to find her staring out over the eternal void.

"Where next?" she asked, catching his glance.

He shrugged unconcernedly.

"No idea. There must be something somewhere worth colonizing. Guess we'll keep on cruising until we find it."

She did not answer, but instead began to laugh, finally ended up with a delighted scream of merriment.

"Why the hysteria?" he questioned gruffly.

"Just think!" she cried breathlessly. "I was right in what I said. You *could* go right back to President Bentley and hand him a ball of nothing! That's all that world turned out to be!"

"As empty as your yellow head," he agreed calmly. "Maybe next time we'll find one just as dense as—"

He broke off with a widening grin, then ducked as Joyce whisked a cushion from the wall bed and hurled it at him with deadly accuracy.

EANDO BINDER, FRANK BELKNAP LONG, JR., WARD HAWKINS, CLIFFORD D. SIMAK AND MANY OTHERS IN THE NEXT ISSUE OF THRILLING WONDER STORIES

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The SCIENCE FICTION LEAGUE

A department conducted for members of the international SCIENCE FICTION LEAGUE in the interest of science fiction and its promotion. We urge members to contribute any items of interest that they believe will be of value to the organization.

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THE Tenth Anniversary issue of THRILLING WONDER STORIES, celebrating a decade of successful publication, is due in June. THRILLING WONDER STORIES has seen tremendous evolutionary progress in its ten years of existence.

So we're planning to make The Tenth Anniversary issue the most sensational event in the history of science fiction. We've lined up an array of scintillating stories by the leaders in the field. The June issue of THRILLING WONDER STORIES will present novelets and short stories by the masters of science fiction—men who have remained in the background for several years, but who are eager in joining to make our birthday party the most thrilling celebration in the fantasy field.

The names of these authors? We'd like to print them right now, in huge letters. But we're saving it all up for one big treat. See our next issue for further announcements.

The Tenth Anniversary issue will also contain a wide variety of new features of interest to every science fiction follower. Pictures of the most popular authors, together with their biographies! Pictures of *all our artists,* with their biographies! And a great deal more is in store for you in this special edition. Watch for it.

MOST POPULAR STORY IN DECEMBER ISSUE

Here, in each issue, THRILLING WONDER STORIES announces the most popular story in the preceding issue. Novelet, short story, or short short—no matter what it is, your comments will decide.

December's favorite story, based on an analysis of all letters to the editor, was:

HANDS ACROSS THE VOID
A Short Story by
WILL GARTH

Second and third places, respectively, went to HENRY KUTTNER for THE STAR PARADE and CLIFFORD D. SIMAK for LOOT OF TIME.

Which do you consider the most outstanding science fiction story in this issue?

STARTLING STORIES

And here's interesting news. If you are one of the many thousands who have enjoyed Stanley G. Weinbaum's great novel, "The Black Flame," published in our companion magazine, STARTLING STORIES, we know you will be pleased to learn about the next novel to appear in the March issue of that magazine.

Eando Binder, popular author, has written a daring story of a miracle planet in his book-length novel, THE IMPOSSIBLE WORLD. It is an in-

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terplanetary novel crammed with scientific thrills from the first chapter to the last. It is illustrated profusely.

The March issue of STARTLING STORIES also contains other science fiction by popular authors. Then, too, there is another memorable story of a decade ago in SCIENTIFICTION'S HALL OF FAME. As for features, Jack Binder presents the Life of Madame Curie, Discoverer of Radium, in pictures. Also THRILLS IN SCIENCE, THE SCIENTIFIC CROSS-WORD PUZZLE, and an editorial by author John Taine. Look the issue over and let us know what you think of it. We're eager to receive all your suggestions, opinions and comments.

AMATEUR AUTHORS CONTEST

In our October, 1938 issue, the editors of THRILLING WONDER STORIES announced a fiction contest for amateur authors. Stories submitted were to be based on any science fiction theme. The length could be anywhere from 1,000 to 10,000 words.

We pointed out that stories entered in our contest did not necessarily have to be written in professional style. It was a good idea we were after—an original plot. If we thought the author had something on the ball, we would buy his yarn at the same rates offered our staff authors, and whip the story into presentable form.

The contest was somewhat disappointing in view of the relatively small number of submissions. About one hundred stories reached our desk. Some were well written, some poorly written, some had fairly good ideas, but most of the tales showed promise. Two stories, indeed, were deemed good enough to warrant publication, and several others were close runners-up.

The two stories scheduled for an early appearance are:

THE BROKEN AXIOM
By Alfred Bester
100 W. 55th St.
N. Y. C.

THE COSMIC CUBE
By Graph Waldeyer,
435 19th Ave.
San Francisco, Calif.

Honorable Mention: Charles F. Ksanda, 1616 Van Buren St., N.W., Washington, D. C.; John L. Chapman, 1521 Cosmic Avenue, S.E., Minneapolis, Minnesota; Frederik Pohl, 677 Lincoln Place, Brooklyn, New York.

Come on, all you letter-writers! Do you talk a good story, or can you sling a mean pen? We'd like to know. So write up that pet plot you've been thinking about for years and let us have a crack at it. If there's something to your story, you will have the gratification of seeing it published in THRILLING WONDER STORIES, and the—check!

The requirements are simple. Stories must be strictly by amateurs. Anyone who has ever had anything published professionally is not eligible. Type your stories on regular manuscript paper. Double space between lines. And enclose a stamped, self-addressed envelope for the return of your manuscript if unavailable. Stories may be anywhere from 1,000 to 10,000 words in length, as stated before. Mail your stories to AMATEUR WRITERS' EDITOR, THRILLING WONDER STORIES, 22 W. 48th St., N. Y. C. We want to present one new writer to science fiction in each issue. Will you help us?

WHAT'S YOUR SCIENTIFIC HOBBY?

How would you like to have an original cover painting in oils by Artist Brown to hang in your den? We are offering the original covers of past issues of THRILLING WONDER STORIES as prizes for the best letters on the subject, MY SCIENTIFIC HOBBY.

These beautiful covers are free of any printed matter, and are suitable for framing. Just write us an interesting letter on the scientific hobby that has interested you most. If you collect meteorites, we're certain you'd like to tell others about your experiences, collection, etc. The same goes for those interested in astronomy, biology, chemistry, zoology and photography. Letters should be at least 1,000 words in length, and should not be more than 1,500.

The closing date is December 15, 1938. There may be time for you to get in under the line. Send your let-

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ters to SCIENTIFIC CONTEST EDITOR, care of THRILLING WONDER STORIES, 22 W. 48th St., New York City.

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Join the SCIENCE FICTION LEAGUE! It's a live-wire organization of science fiction's most ardent followers. Members get together for discussions of scientific nature, have scientific hobbies, and correspond with one another.

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An attractive membership card, suitable in size to fit your wallet, together with a list of the membership rules, will be sent to you promptly.

CHAPTER NEWS AND GENERAL ACTIVITIES

The Queens Science Fiction League
First Meeting—October 2nd, 1938

Meeting was called to order at 3:15 P.M. Present were Robert G. Thompson, Thos. S. Gardner, James V. Taurasi, Mario Racic, William S. Sykora, Abraham Oshinsky, Arthur DeFord, Ben Galos, Millie Taurasi and Frances Sykora. Robert Thompson gave a short review of the history of the late Greater New York Chapter and the fact was stated that this new club would have nothing to do with the old GNY.

Taurasi was appointed temporary Chairman and appointed Mario Racic, Robert Thompson and William Sykora, as a By-laws Committee, to draw up the By-laws of the club and to bring them in for approval, at the next meeting, which will be held the first Sunday of November. Gardner, Taurasi and Racic made arrangements to go to the office of THRILLING WONDER STORIES to obtain a charter for the new club. Frances Sykora was appointed temporary Secretary.

A motion was made by Taurasi to name the association, THE QUEENS SCIENCE FICTION LEAGUE. The motion was seconded by Racic and passed by the association.

ALL SCIENCE FICTION LEAGUE MEMBERS who live in NEW YORK CITY are asked to join this Chapter. Get in touch with James V. Taurasi or come to one of the meetings. The meetings are held the 1st Sunday of the month at the home of Taurasi, 137-07 32nd Ave., Flushing, N. Y.

LOS ANGELES

The beach party being a success, held at **Playa Del Rey** from 8 P.M. Saturday to 2:00 A.M. Sunday, the members next saw each other at the meeting of August 18, 1938. Only twelve were present to hear news that club's publication IMAGINATION! was to be discontinued because of inadequate time in which members had to put it out.

Meeting of September 1st. Better attendance of 15. Glad to welcome back member Fred Shroyer from vacation trip east. New member, Walter J. Dougherty. Club received **five hundred** scientifictional magazines from Lou Torrance of Kansas, **absolutely gratis,** except for negligible freight charges.

Meeting of September 14, 1938. Summer vacation period now over, more regular attendance of twenty-three was recorded. Charles D. Hornig, founder of the Science Fiction League, came back to L.A. for second time in one year, this time to stay. Paul Freehaffer returned from vacation in Idaho.

Special Meeting of September 29, 1938, was held at home of Nancy Featherstone, fan for many years. Proofs of new T.W.S. companion magazine, **Startling Stories,** were passed around, and greeted with wild enthusiasm. Were we startled. Food and punch were served, and all had swell time.

Meeting of October 6, 1938. Low attendance of only 17. Guest was David Ray Macky, who interested group till almost 10:15 with interesting argument with Fred Shroyer, both brought on for no reason, and both extemporaneous, in regards to the pros and cons of the **Fortean Society,** Fred holding the pros side.

All members living in and about Los Angeles, and we have them from a radius of 15 miles, are invited to come to the Little Brown Room first and third Thursdays of each month at Clifton's Café, 648 S. Broadway from 6 o'clock on. We have new members from all over almost every meeting, and many interesting talks by people of note. Join us, you'll never regret it. Communication with Sec-

(Concluded on page 128)

APPLICATION FOR MEMBERSHIP
SCIENCE FICTION LEAGUE

Science Fiction League,
22 W. 48th St., New York, N. Y.

I wish to apply for membership in the SCIENCE FICTION LEAGUE. I pledge myself to abide by all rules and regulations.

Name .....
(Print Legibly)

Address .....

City .....

State ..... **Age**.....

Occupation ..... **Hobby**.....

I am enclosing a stamped, self-addressed envelope and the name-strip from the cover of this magazine (tear off name-strip so that the name THRILLING WONDER STORIES and the date can be seen). You will send me my membership certificate and a list of rules promptly. (Foreign readers must send an International Reply Coupon, or American stamps, with their applications or they cannot be accepted.)

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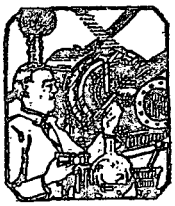

Science Questions and Answers

THREE-DIMENSIONAL X-RAYS

Editor, Science Questions and Answers:

You frequently hear of weaknesses in metallic bodies being discovered by means of X-rays. Suppose there were a flaw in a steel block several feet thick. How would you know just where it was? For X-rays are only two-dimensional. Am I right?

J. K.,
Jersey City, N. J.

X-rays have long been used to study metals for interior defects, but because of the two-dimensional limitations it has been difficult to determine the exact **depth** of flaws from the surface of the metal. Today, by use of the x-ray stereoscope and stereometer, special x-ray views not only show an internal flaw but further indicate—almost automatically—its distance from the surface.

A simple analogy shows how the stereoscope and stereometer work. If you had photographed a block of ice that had frozen around a shirt button, the photograph would give no indication of its depth from the surface. The situation would be similar if you x-rayed a slab of steel—if flaws were present you could see them but again you could not determine their distance from the surface. Now, in the case of the ice, if you wanted to know the depth of the button you simply would photograph the block at an angle.

Comparison of the two photos would show the exact position of the button **within** the ice. Following the same principle, the second x-ray pictures are then placed in a stereoscope, which merges them into one and makes the flaws stand out in their true depth relation.

You can, then, see actual depth in steel. The remaining problem is one of projecting an imaginary—but accurate—ruler into the solid steel slab in order to measure the distance. The effect of one three-dimensional image has been obtained by viewing two flat pictures in a stereoscope. Likewise, the effect of a "ruler" is obtained by two wires in the stereometer. Moved sideward, their image appears to approach or recede, according to the direction of their movement. When the image of the wires coincides in position with the flaw, the distance from the surface is read from the scale.—Ed.

LIFE ON OTHER PLANETS

Editor, Science Questions and Answers:

What are the possibilities of life on Mars and Venus? Could either of those planets support human life?

C. S.,
Philadelphia, Pa.

Venus is the bright enigma of the Solar System, and this is mainly due to her brilliant but dense atmosphere. Her distance from the sun (67,000,000 miles) is compatible with life. Her diameter of 7,580 miles is only a little less than Earth's. No astronomer is sure that he has ever penetrated her dense atmosphere. As a result nothing positive is known about surface markings and hence about the length of a day. But it is fair to assume that a day on Venus is neither too long nor too short for the maintenance of life.

A few years ago Drs. Walter S. Adams and Theodore Dunham of Mt. Wilson made the sensational discovery that there is carbon dioxide in the atmosphere of Venus—the gas out of which vegetation is synthesized by sunlight. But hopes for life were dashed. There is too much carbon dioxide—10,000,000,000,000,000 tons of it, which is about the weight of all our terrestrial air. No fire could burn on Venus; no plant or animal could live. Moreover, Dr. Rupert Wildt, who specializes in mathematical deductions about the planets, is convinced that the atmospheric envelope traps the heat like a greenhouse and that the surface of Venus must have the temperature of boiling water.

Mars has been a subject for dispute ever since Schiaparelli discovered on its surface what he called "canali." It is 141,000,000 miles from the sun, a distance not too great for sufficient light and heat to reach the surface.

The length of the day is right—somewhat more than twenty-four hours. A diameter of only 4,220 miles has led physicists to infer that very little of the original atmosphere has been retained by gravitational pull.

Why is Mars red? Because it is rusty, according to a plausible explanation of Professor Henry Russell. The yellow of Sahara's sands, the redness of the Painted Desert's rocks, the brick color of the ocean bottom—all are caused by oxidation, or rusting. So Mars has been chemically captured. If there are Martians they have either learned to drive off the oxygen from rocks and clays or else, in the course of their Darwinian evolution, they have adapted themselves to the kind of atmosphere they now have. No terrestrial man could live on Mars without a tank of oxygen and a helmet.

It is the water vapor on Mars of which the physicists are sure. They see it not only in the atmosphere, but in caps on the poles—caps which melt away as Summer comes and which grow again in the Winter. But there is very little water. Professor Edward Charles Pickering calculated that if twenty feet of snow fell over a Martian polar area, an ocean of 2,000 miles in diameter, but only two feet deep, would be formed in one of our months during the melting season—just about the amount of water contained in one of the smaller of our Great Lakes.

As the caps melt russet brown areas in the temperate and equatorial zones gradually turn green. Here is evidence of irrigation, argued Percival Lowell. If intelligent beings on Mars exist they would sink all their hatreds in a cooperative effort to irrigate the deserts with melting polar snow. In Schiaparelli's "canali" Lowell saw the necessary ditches.

This romantic interpretation of the seasonal Martian aspect was never accepted by astronomers. On the other hand they are no longer so ready to deny that when the russet brown areas turn green we may actually behold the growth of vegetation. "Tuft-forming grasses such as grown on high prairies, and especially the mosses and lichens which grow in Arctic regions," surmises Dr. William Coblentz, who

THIS department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited, we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical, also, to promise an immediate answer in every case. However, questions of general interest will receive careful attention.

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made one of the most thorough studies of the planet on record. But higher Martian life? Reputable astronomers won't say.—Ed.

THE STRANGEST INSECT

Editor, Science Questions and Answers:

I've noticed that THRILLING WONDER STORIES often features articles and stories regarding insect life. Entomology is a hobby of mine, although I'm just beginning at it. But here's what I'd like to know. Can you furnish me with some information regarding the sexton beetle? I am told that this insect is a particularly interesting one.

G. W.,
Denver, Colorado.

Sexton beetles are probably the most industrious of all insects. These insects are the grave diggers of the animal world. In his book, "Strange Insects and Their Stories," A. Hyatt Verrill, noted explorer, points out that these insects face an entirely new problem with every dead body they find. No two bodies are exactly the same size. Never twice are the bodies in exactly the same position, and in nearly every case the earth to be excavated differs from other localities. But you can't stump a sexton beetle, or rather a pair of them, for they always work in pairs.

They will even attempt to bury a good sized dog or cat, and sometimes will succeed. But ordinarily they confine their labors to dead creatures which they can bury. If the ground where the corpse rests is unsuitable they will manage to drag and haul the body to some better spot.

In their task of burying a dead body these beetles first of all crawl all over it, examining it carefully, often descending to the earth and walking around the body as if estimating the size and depth of the grave required. Then they begin digging with their heads and feet, the male beetle doing most of the work, throwing out the earth from underneath the body, until it begins to settle into the excavation. If the dead creature catches on the sides or ends of the grave, which is always a snug fit, or fails to drop into the grave properly, the little orange and black undertaker will crawl beneath it, tugging and hauling at fur or feathers. Frequently, too, he will climb onto the body and will stamp upon it with his feet or jump up and down striving to force it into the grave. After laboring steadily for a time, the beetles relieve each other, one working while the other rests, relaxing with cramped legs stretched out and head leaning against a pebble or even the side of the dead animal.

Gradually, as the grave is deepened, the body sinks below the surface until the beetles, satisfied that it is buried deeply enough, fill in the grave and cover the body from sight. After the female has deposited her eggs beside the corpse which will supply food for her brood, the insects leave in search of more bodies to be buried.—Ed.

ANALYZING METALS

Editor, Science Questions and Answers:

Given a minute quantity of a metal, how can scientist analyze it? Wouldn't the very process of analysis do away with the sample?

M. E.,
Wichita, Kansas.

The microscope is used in analyzing substances where only minute quantities of samples are available. This is particularly true where the sample must be taken without mutilating the object to be observed. Rare coins, for example, are subjected to qualitative analysis by treatment of the streak of metal left by rubbing an edge of the coin on a piece of ground glass. In the analysis of the streak of metal left on the glass, the minute quantity of metal is first dissolved and drops of the solution subjected to the action of an appropriate reagent on the microscope side. The resulting precipitate is examined microscopically and identified by its appearance, and optical properties.—Ed.

THE COAXIAL CABLE

Editor, Science Questions and Answers:

What is probably the greatest single telephone advance since the invention of the vacuum tube is probably the coaxial cable, I believe. One has recently been installed experimentally between New York and Philadelphia. Over this line, a copper tube with one wire inside will carry 240 simultaneous conversations. Can you please explain to me how the 240 wavy lines of 240 conversations are converted into a single wavy line, this to be sent over the long-distance wires, and then separated into its 240 original wavy lines?

E. B.,
Dallas, Texas.

The coaxial cable is an apparent miracle made possible by the crystal wave filter and the vacuum tube. Here's an analogy that might explain the phenomenon you mention. The phonograph, for example, mixes the sound waves from the violins, the oboes, and the rest of the orchestra into a single wavy line which it records. The unscrambling is the hard part of the problem. It is as though we were to take 240 inks of different colors, ranging from red to violet, which we must pour all together into a pipe, let their mixture flow through this pipe, and then hope to get the inks separated at the far end.

To accomplish this feat, we must first invent a suitable method and then find some means of carrying it out. We can solve the ink problem by using carriers. Let us buy white, porous marbles in 240 sizes. Then we will soak the biggest marbles in red ink until the ink has been all absorbed, wipe them carefully, and dry them.

The marbles of the next size we dye internally with the ink of the next color, and so on down to the violet ink, which goes into the smallest marbles. Now send the marbles through the pipe. At the far end, arrange the holes so that all but the largest marbles will drop through into another pipe. From there, all but the second largest can be made to drop through into a third pipe. Two hundred and forty such strainers would automatically separate all the marbles into their size groups, and hence the inks into their colors. Now let the marbles of each color drop into separate water baths where the ink pigments will dissolve, and we get our 240 different-colored inks separate and uncontaminated, after having flowed together through the same pipe.

Actually, the telephone problem is simpler. Instead of marbles, electrical vibrations are used. The biggest marbles correspond to vibrations of over a million a second; the smallest, to 60,000 vibrations a second. Vibrations can be fastened together just as ink will go into porous metals.

The ink of one color represents the wavy line of one telephone conversation. Each conversation is made up of vibrations ranging from 60 to 4,000 vibrations a second; so when it is applied to a 60,000-vibration carrier wave, there result vibration rates between 60,060 and 64,000. Another conversation is applied to a 64,000 vibration wave, and so on until 240 conversations have been applied to waves of different vibration rates. Then these conversations are all sent together over the transmission line. At the far end, electrical filters, corresponding to the marble strainers, separate the different number of vibrations, those from 60,000 to 64,000 going into one line, those from 64,000 to 68,000 into another, and similarly for the rest.—Ed.

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The Story Behind the Story

HAVE you ever tried to write a science fiction story? It's simple. All you need are paper, typewriter, and the determination to write. Splendid!

Put the paper into the typewriter. See how awesomely blank it looks. Dear! Dear! Paper never looks so blank as when it is placed in a typewriter and one sits before it faintly determined to put something interesting on it.

Let's see. What shall we do this time? Write a yarn explaining the formation of the craters of the moon—that they are the result of a war between the moon people and the Martians, and that the craters were caused by a bombardment of radio-controlled missiles? No . . . that's been done before. Well, then, how about a novelet based on the theory that the asteroid belt circling our Earth is the result of a tenth planet which exploded many eons ago? Nope . . . that one sounds familiar, too. We'll have to think of something more original.

How about a tale involving a new application of a perpetual motion fallacy. Make the perpetual motion machine work! Ah, we've got something there. But wait a minute . . . what do we know about perpetual motion? We'll have to go to the public library for some research. Say, this writing business is tough. A guy has to work before he can get some coin from the editor!

Yes, brother, writing a science fiction yarn isn't frictionless sailing. There's plenty of calorie-shedding involved before a plot sees "finis" tacked to it. So lend an ear to the plaintive wails of your brethren as they give us the official data concerning the genesis of their scripts.

THE ZERO PLANET

Some of you may have already scanned the table of contents of this issue, and the forecast for the next. "What, no Gerry Carlyle or Anthony Quade!" you thunder. The explanation is a simple one. The Messrs. Barnes and Kuttner won't write the yarns unless they have something really intriguing in mind. So sit tight for an issue or two while the boys go off for a hop in their space ship in search of new exploits. Which brings us to the point—WORLD WITHOUT CHANCE, by Polton Cross.

WORLD WITHOUT CHANCE is a sparkling interstellar adventure yarn, written in the scintillating vein of the Quade-Carlyle series. Imagine a world where nothing ever happens, in some far-off Solar System! But, to write this tale, Polton Cross had to engineer something that happened, else he'd have nothing to say. Here's the author's explanation of how the whole thing came about:

The idea of this story really began by the immortal expression "Not a chance!" A friend of mine recently made that remark in connection with the plot of an embryonic story I threw at him. He retorted with the expression,

"A world like that wouldn't have a chance!"

I fell to linking up the words "world" and "chance." Just suppose a world **could** exist where nothing **was** left to chance That got me started, but it took some time to work out how such a thing could happen—clearly it could only be a world without a random element, where a deck of cards—in the metaphor—had gone through all available shuffflings.

I worked the idea out as best I could, but in such a world nothing could happen—therefore there could be no story, of any value anyhow. Unless I introduced a random element that got things on the move again! That was it! Hence the projection of Arch Lakington and his wife into a world where nothing had ever happened for uncounted millions of years, where the scientists were so smart they'd outsmarted themselves and sat around like a lot of frostbound lizards.

Maybe the idea isn't so strange at that. Within our own scope of knowledge everything progresses to a given end: one day the power of change and shuffling will be at zero. But if a master scientist brought such an event into being right now I imagine he'd give us a world very like the one I've tried to picture in WORLD WITHOUT CHANCE.

SUPER-EVOLUTION

Virtually all organic life, as we know it, depends on carbon. A world in which silicon is the vital element for the existence of life has often been conjectured by bio-chemists. Silicon life—plus evolution steeped up along new channels—prove interesting ingredients in the formula for Max C. Sheridan's novelet, THE HUMAN EQUATION. Like his contemporary, Polton Cross, the author of this story received his stimulus from a friendly conversation. We'll have to try that method ourselves!

Seems funny when you really get down and analyze the inception of a story idea; most of them start with some simple phrase or discussion that takes root and grows and grows like Jack's Beanstalk until it evolves into a complete plot.

In the case of THE HUMAN EQUATION, the whole thing started with a discussion on precious stones. A friend of mine was showing me a collection of gems he had found in various parts of the world, and among them was a diamond and a beautiful emerald.

"Queer thing," my friend said, "that one of our most precious stones is an allatropic form of carbon, and the other is a variety of beryl—a compound of silicon."

"What's so queer about that?" I asked.

"The fact that of our two most precious stones—one is carbon,—the basis for life as we know it. The other, silicon, is carbon's closest relative in the chemical family. Seems as though there might be some strange and intrinsic connection between the two elements, doesn't there?"

"Just a wee trifle far-fetched," I objected. "They simply happen to have somewhat similar properties as do many other elements of the same groups. For instance—the Halogens."

"Maybe so," he admitted. "But carbon and silicon seem to be allied in an entirely different way. It doesn't seem to be simply a variation in activity as in the case of the Halogens. You know, I've always wondered what our chemists could do with silicon if it could be forced to form ring and cyclic compounds like carbon does."

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"Perhaps it will under proper catalytic influence," I suggested.

My friend was silent for a moment. "Funny thing," he said suddenly, "that out of the long list of elements, carbon is the only one forming the structural basis for the phenomenon we call Life."

Now I love an argument—in any shape or form, so—not two minutes after calling my friend's mild suggestion "far-fetched," I immediately did an about-face and started to argue the possibility that life has existed some time in the eternal past with a basis other than carbon.

I advanced the argument that we have absolutely no definite proof that such life has not existed. All we know is that such life does not exist on the surface of the Earth today,—and that—I informed my long-suffering friend, only means that such a non-carbon life must have had certain handicapping characteristics which labelled it inferior to carbon-life and eventually brought about its extinction.

Anyhow, I convinced myself, if not my friend, and THE HUMAN EQUATION is merely the extension of my argument to the nth degree—or maybe further.

EXTRA-SENSORY PERCEPTION

One of the most fascinating phenomena in Nature is that horde of strange creatures, the lemmings. Science offers various explanations for the mass suicide instincts of these animals. In his novelet, THE TELEPATHIC TOMB, Frederic Arnold Kummer, Jr., uses this analogy to advantage. Here's his story:

As to the Story Behind the Story of THE TELEPATHIC TOMB, my idea was based upon the lemmings of Norway. These animals, obeying some atavistic urge, plunge by the thousands into the sea off the Norwegian coast every few years. In somewhat the same class we have the annual salmon run, the homing instinct of the pigeons, the mass migratory movements of early peoples. With such peculiar impulses among animals, it is not hard to conceive of similar movements among humans, particularly when drawn by a tremendous telepathic attraction.

Dr. Rhine of Duke University has taken telepathy from the hands of the spirit medium and fortune telling fakers and made it a vital scientific study. His tests with variously marked cards, his discovery of extra-sensory-perception, have convinced me that in the field of mental research a new frontier has been reached. Having followed Dr. Rhine's experiments closely due to my interest in such matters, it was only natural that a story about telepathy should be forthcoming.

TANGLED DESTINIES

THE BRIDE OF SAN LUIS REY remains one of literature's immortal classics. Written by Thornton Wilder, the book reveals the poignant drama of several lives enmeshed by Fate into a skein of stirring events. Gordon A. Giles, the author of this month's cover story, THE FLIGHT OF THE STARSHELL, utilizes this theme, spins a science fiction treatment around it, and weaves a pattern of strong suspense into his subject. This type of story is brand-new to science fiction. Let us know what you think of it.

The Bridge of San Luis Rey furnished the basis for the theme of this story. If human lives and destinies can be so intertwined in the ordinary walks of life, why not aboard a space liner also? I had to assume, for the purposes of the story, that interplanetary travel was quite established, as common almost as voyaging across the ocean. Thus on any trip might be crowded together dozens of people, with varied aims, thoughts, purposes in life. But with their combined fate in the hands of chance—and chance is unpredictable.

We have all looked forward to arriving some place, on some trip, short or long. Destination reached, we are prepared to take up a certain thread of life. But what if an emergency intervenes? The thread is broken, at least temporarily. In the dramatic sort of accident portrayed in this story, whole lives may be changed, whether for better or for worse. Here, of course, I made Fate a benign creature, ironing things out for the characters involved.

There is not much more to the story. It is an attempt to show how human lives can be affected by the unforeseen, in an appropriate futuristic setting. Instead of the characters doing things, thereby choosing their own courses of action, things are done to them, and their individual destinies twisted into new channels by fate. Or by the author. I hope I haven't been too high-handed with them.

To let my hair down, I was on pins and needles all during the story, alternately doing the worrying for a half dozen people to whom arrival on Earth meant something unwanted. I was pretty relieved when everything had been straightened out. I enjoyed writing the story. Crossing my fingers, I extend the hope that you readers enjoy the effort.

THE PREHISTORIC PAST

Ever wondered what New York looked like in prehistoric times? Or wherever you've been born? Arthur J. Burks, the author of THE DISCARDED VEIL, wanted to go back in Time to learn more about a certain community as it existed in primitive days. The only way he could shoot back there was through time. So his type-machine became his time machine. And he's done a pretty good job. Here are a few words from the maestro himself.

Some little time ago I visited the Grand Coulee Country, and the Grand Coulee Dam. Steamboat Rock, standing in the middle of the Coulee, north of Dry Falls, obsessed me with the idea of its vast age. I remembered having passed it many times when I was a little shaver, for the coulees were my home when I was less than six feet tall and couldn't spell cat, when, in fact, I had to be carried in mommer's arms.

I got to thinking, on my recent re-visit, of all the things that might have happened at Steamboat, when the rock had been an island in the middle of the vast prehistoric river that ran through the coulee. How to find out? How to go back? I had to invent a way, then guess, and use the old imagination something fierce. "Discarded Veil" is the result. I trust folks will like it.

THE STORY BEHIND THE STORY
Appears in Every Issue of
THRILLING WONDER STORIES

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FIVE STAR ISSUE

By Sam Moskowitz

It has been some ten days since the December issue of THRILLING WONDER STORIES hit the newsstands. It is not my policy to do much writing to the science-fiction magazines, but I believe it only fair to give credit where credit is due, particularly when I am specially pleased with a certain number of T.W.S.

Most science-fiction readers are satisfied when they find an outstanding story in an issue of a science fiction magazine, and I'm not much different. However, the thing that causes me to write is the really amazing fact that the December issue of THRILLING WONDER STORIES contained *five* distinctive stories, and the remaining two were far from poor. Without a doubt this is your best issue to date. The five best being in their respective orders "The Star Parade" by Henry Kuttner, which, paradoxically enough, heads the list. Formerly I didn't give a hoot for the Hollywood-on-the-Moon series, but now I go down, happy in defeat.

Second on the list is Eando Binder's really great new theory of the formation of Atlantis. A really original idea. Binder contributes his best stuff to T.W.S. Third is Will Garth's story, HANDS ACROSS THE VOID, which is by far the best he's ever done. The yarn shows infinitely better craftsmanship than displayed in his former tales. Fourth is Clifford D. Simak with a really fine effort that raises him high in my estimation.

For fifth place I designate the Weinbaum story which, while not as dynamically interesting as Stanley's stories, was nevertheless a darn good yarn, if considered independently. This issue is your best to date, the second best being the December, 1936 issue, which contained three outstanding yarns by Weinbaum, Campbell and Zagat.

I noted the upward trend in your last issue with the outstanding yarn, "Of Jovian Build." I sincerely hope you haven't made a mistake in this latest issue and printed the tenth anniversary issue in advance. It's almost too good to be true.

I have seen the new companion magazine, STARTLING STORIES, and am tremendously pleased with it. As for stories to be published in STARTLING STORIES' Hall of Fame, I nominate "The Boneless Horror," by Dr. David H. Keller; "The Marble Virgin," by Kennie McDowd; "The Stellar Missile," by Ed Earl Repp; "The World of a Hundred Men," by Walter Kately; "The Land of the Bipeds," by Francis Flagg; "The Infiinite Brain," by John C. Campbell, and "The City of the Living Dead," by Manning and Pratt.

I suggest that every year you advance the volume from which you take your selections. For instance, for the first six issues of STARTLING STORIES, use only stories from the old Science Wonder. The second six, use stories from Volume II. Get what I mean?—603 So. 11th St., Newark, N. J.

(Your nominations for STARTLING STORIES' Hall of Fame are good. Three of the yarns you name have been on our own mental list. Come on, veteran T.W.S. readers, what are your suggestions?—Ed.)

In this department we shall publish your opinions every month. After all, this is YOUR magazine, and it is edited for YOU. If a story in THRILLING WONDER STORIES fails to click with you, it is up to you to let us know about it. We welcome your letters whether they are complimentary or critical—or contain good old-fashioned brickbats! Write regularly! As many of your letters as possible will be printed herein. We cannot undertake to enter into private correspondence.

GOLD'S WHERE YOU READ IT

By Allan Saun

I have recently discovered a gold mine. Yes, a gold mine! Now, the "gold" isn't the expensive metal, but several rare copies of the old Wonder Stories. On comparing the old copies with the newer ones, I find that the stories and illustrations are much better in the issues marked T.W.S.

Your present line-up of authors are great—keep 'em. Two old writers I would like to see return are Laurence Manning and D. D. Sharp. Incidentally, in the August, 1935 issue, a story entitled "The Reign of the Reptiles," by A. Connell, contained a poem written by William Herbert Carruth, which I consider very thought-provoking. I think it bears repetition.

A fire mist and a planet
A crystal and a shell,
A jelly fish and a saurian,
And caves where the cavemen dwell;
Then a sense of law and beauty,
And a face turned from the clod—
Some call it Evolution,
And others call it God.

Now for the December, 1938, issue of THRILLING WONDER STORIES:

The best story, in my opinion, was "The Star Parade." I was sorry to see that a Gerry Carlyle yarn wouldn't appear in the next issue. Those Gerry Carlyle-Anthony Quade series are the tops. I liked "The Metal Ocean" for two reasons. One—it was written by Eando Binder. Two—it had a surprise ending that floored me. Reading science fiction has often made me wonder what the late Stanley G. Weinbaum looked

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like. His picture, along with his and his sister's story, certainly pleased me. All the rest of the stories were excellent.

The last few stories Ray Cummings has submitted to you have been swell, but I would still like to read a story by him similar to the one he wrote a few years ago entitled "Elixir of Doom." And thanks a lot for the companion mag.—Toronto, Canada.

(Ray Cummings has been working on a novel based on an absolutely new theme in sub-atomic worlds. We hope to announce the story shortly in a future number of STARTLING STORIES.—Ed.)

SALUTE TO SCHOMBURG

By Russell A. Leadabrand

A brief note of praise—and that mainly goes to your superb new illustrator, Alex Schomburg! More of his work! Marchioni in my opinion could be discarded without a really serious loss. I'd like to see what Schomburg could do with a cover.

"Tidal Moon" was something of a disappointment. Perhaps I expected too much. Kuttner, however, copped top honors with "The Star Parade." "The Great Adventure" wasn't so hot. "The Loot of Time" took second honors.

Here's for THRILLING WONDER STORIES' continued success.—Route q, Box 264A, Dinuba, Calif.

ANALYSIS

By Thomas S. Gardner

I liked the cover on your December issue. The white background was effective, and the subject matter was mentally stimulating.

T.W.S. has suffered in the past from juvenile tendencies. However, it is slowly coming out of that stage.

The best selling characters in T.W.S. are the Gerry Carlyle and Quade of the Movies on the Moon bunch. They add something that most stories lack—humor. They are intensely human and a big point is that they are natural. In fact the situations could happen given certain developments and the stage is not set just for the story as in many. I wish to emphasize the naturalness of the Carlyle-Quade duet. A novel com-

(Continued on page 123)

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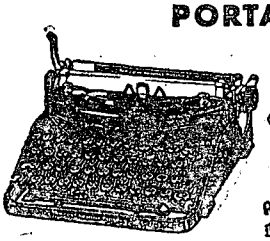

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(Continued from page 121)

bining the two would be very good for STARTLING STORIES. Getting back to T.W.S., "The Star Parade" was good.

"The Loot of Time" had the juvenile touch. It was just good plain adventure with a framework of super-science thrown in to call it science fiction. When will the Atlantis pest end? "The Metal Ocean" is science fiction that is a re-working and another explanation of another old plot. On the other hand, "Hands Across the Void," by Garth is a gem. It contains psychology of a type that is far above mankind. For idealistic concepts combined with a logical development of life trends, that story can hardly be beat. It has been said that a great story must leave one with a feeling of sadness—although I do not believe that is the total element of greatness—witness "The Black Flame," although its predecessor, "The Dawn of Flame" did, I believe that Garth's story needed that single point to make it a masterpiece.

I am sorry to say that Cummings has not had a good plot or story in a long time. "The Great Adventure" contained nothing new, interesting, plot, nor characters. It was just a sketch that failed to picture a mental image of interest in the reader. That is unfortunate; for Cummings has written some of the best stories in s-f—but that was ten years or more ago.

Miss Weinbaum need not apologize for finishing up her brother's plot for "Tidal Moon." She is almost as good as her brother. I made it a point to ask six readers the same thing—their opinion as to the story and how it compared with Stanley's stories. One and all said that they could detect the difference—but they all voted it a darn good story. Thus Miss Weinbaum may have a style that is as good as her brother's. Let's have more by her and then we'll see.

Hamilton's stories have changed more than any single writer in the last fifteen years—for the better mostly. Witness the difference between the "Doom Man" type and his later stuff. However, "The Cosmic Hiss" is not one of his best—it too shows the juvenile touch of great danger to the earth—brave scientist saves Earth, etc.

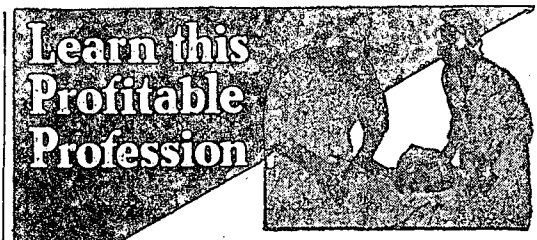
The special features lend interest to the magazine. The best is Binder's "IF." The Reader Speaks is always interesting. So you can count three first-class stories in the December issue—Kuttner's, Garth's, and Weinbaum's. The rest were not distinctive. —903 John Jay Hall, Columbia University, New York.

GARTH'S GEM

By T. Bruce Yerke

"Hands Across the Void," was one, if not the best story, in the December issue of T.W.S., and is one of the best stories that you have ever published. It was a real gem, and I hope it is the first of a new type to appear in our magazine. (Right! Watch for

(Continued on page 124)



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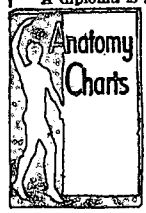

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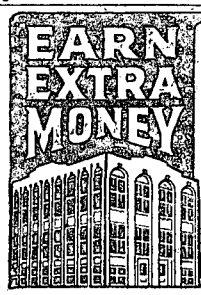

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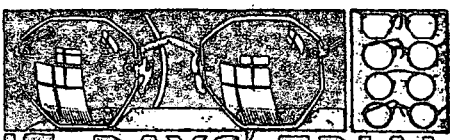

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(Continued from page 123)

"Experiment," by Dr. Roscoe Clark, in an early issue. It will be illustrated by the famous fantasy artist, Virgil Finlay.—Ed.)

"The Star Parade," by Henry Kuttner, was the best in the series, even if the creature, "Jigsaw," was somewhat far-fetched. "The Great Adventure" was secondary, though the ending was pretty good. "The Loot of Time" was second best in the issue, and is Simak's best to date. His character, "Old One-Eye," took the prize for the story. As for Weinbaum—you can't imitate him. Though "Tidal Moon" was not comparable to any of his other stories, Miss Helen Weinbaum should be complimented on her work. From the standpoint of a story, her yarn was very good. I tie it with "Loot of Time."

"The Cosmic Hiss" is of the familiar variety wherein the hero makes a machine of some sort from directions via other planets. Just a good filler.

"The Metal Ocean" was a unique and delightful treatment of the Atlantis theory. Give it third. Who wrote it, E or O? On the whole, THRILLING WONDER STORIES has been on a general upward trend from the start. Keep it up, and good luck to STARTLING STORIES.—1207½ N. Tamarind Ave., Hollywood, Calif.

LEAGUE MEMBERS, NOTE!

By Arthur L. Widner, Jr.

Here's my opinion of the October issue. "Satellite Five" cops first, "Cosmic Teletype" 2nd, and "Brain Pirates" 3rd. No. 1 was the only one that didn't really have anything wrong with it. No. 2 built me up for a big letdown. Started off with a swell idea, then degenerated into a hero-saves-Earth-from-invaders-by-sacrificing-own-life tale. Tsk! No. 3 wasn't as funny or as interesting as the rest of the Penton and Blake series. Somehow, I got the impression that Campbell dashed it off in a spare moment just to be accommodating. But don't let that stop you from continuing Penton and Blake. When they're good, they're GOOD! And when they're not good, they're not bad.

Looking forward to Simak and Weinbaum, and the companion magazine. If it's as good as T.W.S, I'll buy it.

"The Challenge of Atlantis," while ordinary run of the mill stuff, deserves credit for not having the U. S. overrun with the invaders. It's a relief to get some really nice invaders that'll listen to reason.

"Of Jovian Build" was O. K. but one small inconsistency spoiled it. The author neglected to make arrangements for Mr. Jovian's clothing to grow with him. Also his scepter-heat-ray. And when beleaguered,

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why did he not defend himself with said disintegrator? Then too, the cover was all out of proportion. No fault of Friend's but it helped spoil the story just the same.

It mentions the giant 700 feet tall at full growth, yet in the picture he is taller than the Empire State Building which is a little over a thousand feet. Also the people he has clutched in his fist are no pygmies either. According to his proportions they must be about 30 feet high themselves. And that is figuring on the basis of a 700 foot guy.

And by the by, are my eyes deceiving me, or did the one and only Paul illustrate the article about Micromegas? How about him doing a couple of stories and an occasional cover?

This new artist, Schomburg, is pretty good, although he seems to have a Flash Gordon complex similar to Binder's. Wesso is as good as ever, Marchioni fair.

Here's my suggestion for the first reprint classic: "The Time Stream," by John Taine. I have only been able to secure one part of this and would very much like to read the entire narrative.

I've been a member of the S.F.L. lo, these many years, in fact a first-class member, but could I get a Chapter in a city of 80,000? No! Now that I'm in a little hick town maybe I'll have better luck. I'd like to get in touch with all fans and members living in Quincy, Brockton, or Plymouth or the area in between, with a view toward starting a local Chapter. We could meet at various intermediate points from time to time to save strain on any one member's pocketbook.

Well, I gotta cut this short if I expect to see it in these columns. So I'll close with a request for some correspondents—male or female—who like science fiction. All letters answered.—Brantville, Mass.

(Frank R. Paul did illustrate the articles by C. P. Mason. Mr. Paul has joined our staff of artists, and we plan to use his work regularly from now on.—Ed.)

CORRECTION

The letter attributed to Dorothy W. F. Meyer, in the READER SPEAKS department of the December issue, was really written by Mr. Douglas W. F. Mayer, editor of the English magazine, TOMORROW.

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WANT printing press, type, small radio, camera. Have prisms, earphone, radio, tubes, chemical apparatus, stamps, coins, mineral specimens, fossils, Indian head pennies, etc. S. F. Royall, Williamsburg, Virginia.

WHO'D like to have a nine tube A.C. set, radio supplies, wood piccolo, telescope kit, and other items? I would like a microscope, telescope, oculars, or such. Jack Connell, Nashville, Indiana.

I WANT salt and pepper shakers, United States stamps, book match covers, novelties, curios, first day covers for what you have to offer. M. B. Riley, 8609 Madison Avenue, South Gate, California.

WILL swap mint U. S. stamps with anyone in foreign countries for mint stamps of your country. Commemoratives and regular issues. John W. Laufenberg, 1201 Eleventh Street, Port Arthur, Texas.

OFFERING large stamp collection, earphone, electric pencil, electric train set, knapsacks, camp stoves, unused harmonica, etc., for phonograph, printing outfit, or? Jerome Zajicek, Jr., 6428 Fairfield Avenue, Berwyn, Illinois.

SEND me United States stamps, good early issues and commemoratives up to 1927—no common. I'll send you Union and British African; state wants. Sonny Kleu, Box 397, Cape Town, South Africa.

I WILL swap good Australian, New Zealand stamps, mint used, also coronations, commems, F.D.C., etc. Want mint U. S. stamps, good magnifying glass, small microscope. James T. Spalding, 317 E. Ormsby Avenue, Louisville, Kentucky.

FOR each 100 precancels sent me, I will send a valuable illustrated booklet. Colonel Newman, 2633 N. Vancouver Avenue, Portland, Oregon.

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SCIENTIBOOK REVIEW

SCIENCE FOR THE CITIZEN. By Lancelot Hogben. Alfred A. Knopf. $5.00. With 480 Illustrations by J. F. Horrabin.

In *Mathematics for the Million*, Professor Hogben expounded the language of science in the light of social progress from prehistory to modern times. In this new work he has done the same thing for science itself. Here the entire realm of science is his field—astronomy, physics, chemistry, biology, psychology—described and interpreted as a tool which shapes society and which society in turn sharpens to a keener edge.

Distinguished alike by its clarity of exposition, its breadth of learning and its humanistic outlook, SCIENCE FOR THE CITIZEN is a magnificent achievement, a compact encyclopedia of man's knowledge of himself and the Universe in which he lives.

In twenty-three fascinating chapters, Professor Hogben manages to compress skillfully the highlights of all the major sciences. Essential principles of the different "ologies" are forcefully driven home; the author swings from the most elementary step in a scientific field to its most advanced stage with an ease that is pleasantly surprising.

Some chapters, however, present difficulties to the uninitiate because of the extreme condensation of the subject matter.

If you want to get a focus of "the impact of science on society," by all means turn to Professor Hogben's latest work. The author terms his book "a primer for the age of plenty." But it is more than that.

The author's lively style imparts a refreshing and intriguing novelty to even the most familiar propositions. The summaries of present-day positions and tendencies all are enhanced by witty comment and shrewd references to the social problems of our own age.

Each chapter of the book ends up with a questionnaire, in which the reader is to test his knowledge by applying what he has read in the previous chapter. So, besides succeeding in making his book an almanac of human wisdom, SCIENCE FOR THE CITIZEN is a magnificent self-educator.—M.W.

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Back Pain and Kidney Strain

Wrong foods and drinks, worry, overwork and colds often put a strain on the Kidneys and functional kidney disorders may be the true cause of Excess Acidity, Getting Up Nights, Burning Passages, Leg Pains, Nervousness Dizziness Swollen Ankles, Rheumatic Pains, and Puffy Eyelids. Help your kidneys purify your blood with Cystex. Usually the very first dose starts helping your kidneys clean out excess acids and this soon may make you feel like new again. Under the money-back guarantee Cystex must satisfy completely or cost nothing. Get Cystex (siss-tex) today. It costs only 3c a dose at druggists and the guarantee protects you.

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SCIENCE FICTION LEAGUE

(Concluded from page 115)

retary T. B. Yerke, 1207½ N. Tamarind Ave., Hollywood, California, for details and inquiries.—Report by T. B. Yerke, Sec.

FORT WAYNE CHAPTER

Thaddeus Dikty, of 3136 Smith Street, Fort Wayne, Indiana, would like to organize a SCIENCE FICTION LEAGUE CHAPTER in his city. He is being assisted by Robert Formanek. Will readers of THRILLING WONDER STORIES desirous of joining please communicate with Mr. Dikty at aforementioned address?

SOUTH AUSTRALIA CHAPTER

John Devern, of 125 Gilbert Street, Adelaide, South Australia, is eager to start a Chapter of the S.F.L. in his city. He also announces that the first Australian fan magazine, the Science Fiction Review, will soon be ready for distribution. Will all neighboring readers please communicate with Mr. Devern?

PITTSFIELD CHAPTER

Mr. Robert A. Fowler, 12 Beacon Ave., Pittsfield, Mass., would like to form an S.F.L. Chapter in his city. Will all T.W.S. readers in his vicinity contact him?

IMPORTANT NOTE

To obtain a Charter for a Chapter in the SCIENCE FICTION LEAGUE, it is necessary to present the editor of THRILLING WONDER STORIES with the names of at least ten members of the Chapter, each of whom are members in good standing of the SCIENCE FICTION LEAGUE.

(A list of new SCIENCE FICTION LEAGUE members here and abroad will appear in the next issue of THRILLING WONDER STORIES.)

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ANSWER TO SCIENCE QUIZ
on Pages 62-63

POSITIVE OR NEGATIVE?

1. True.
2. False.
3. True.
4. True.
5. True. Under pressure the freezing point of water is lowered; and on a frozen lake the skate runners provide the pressure.
6. False. The photographic plate is more sensitive to the green and blue regions of the spectrum than the red.
7. False. Only the application of the principle can be patented.
8. True. If there were no air pressure at all, the water would evaporate no matter how low its temperature.
9. True.
10. False. It forms on the inner surface.
11. True.
12. True. Jupiter's surface is covered with belts which revolve at varied speeds.
13. True.
14. False. Animals that reproduce by binary fission, notably the one-celled species, are immune from normal death. In these forms the identity of the parent is merged with that of the offspring and death is always accidental.
15. False. The tail points in a direction directly away from the sun.
16. True.
17. True.
18. True. So states a theory recently set forth by astronomers. The remaining four-fifths is derived from the particles of electricity from the sun which "strike sparks" when they strike against molecules of the upper atmosphere.
19. True.
20. False. It is 1,051 miles **below** the surface of the Earth.

TAKE A LETTER

1. a; 2. d; 3. c; 4. b; 5. b; 6. c; 7. a; 8. c; 9. d; 10. d.

SCRAMBLED LAWS

1. The strain is proportional to the stress. Hooke's Law.
2. To every action there is always an equal and oppositely directed reaction. Newton's Third Law of Motion.
3. At constant temperature the volume of a gas varies inversely as the pressure. Boyle's Law.
4. The orbit of every planet is an ellipse with the sun at one of its foci. Kepler's First Law of Planetary Motion.
5. Equal volumes of all gases at the same temperature and pressure contain the same number of molecules. Avogardo's Law.

UP AND ATOM

1. alpha; 2. orbit; 3. isotope; 4. quantum; 5. valency; 6. electron; 7. corpuscle; 8. isomerism; 9. radiation; 10. equivalent; 11. ionization; 12. radioactivity.

COMMON SENTENCES

1. All are caused by our atmosphere.
2. The names of places on the moon.
3. Diseases caused by vitamin deficiency.
4. Parts of the heart.
5. Freudian interpretations of dream symbols.

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28x4.75-19	2.45	1.25
29x4.75-20	2.50	1.25
29x5.00-19	2.85	1.25
30x5.00-20	2.85	1.25
5.25-17	2.90	1.35
28x5.25-19	2.90	1.35
29x5.25-19	2.95	1.35
30x5.25-20	2.95	1.35
31x5.25-21	3.25	1.25
6.50-17	3.35	1.40
28x5.50-19	3.35	1.40
29x5.50-19	3.35	1.45
6.00-17	3.40	1.40
30x6.00-19	3.40	1.40
31x6.00-19	3.40	1.45
32x6.00-20	3.45	1.55
33x6.00-21	3.65	1.55
32x6.50-20	3.75	1.75
6.00-16	3.75	1.45

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33x4	2.95	1.25
34x4	3.25	1.35
32x4½	3.39	1.45

Size	Tires	Tubes
33x4½	$3.45	$1.45
34x4½	3.45	1.45
30x5	3.65	1.65
32x5	3.75	1.75
33x5	3.95	1.75

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34x5	4.25	2.25
32x6	7.95	2.95
36x6	9.95	4.45

Size	Tires	Tubes
34x7	$10.95	$4.65
38x7	10.95	4.65
36x8	11.45	4.95
40x8	13.25	4.95

TRUCK BALLOON TIRES

Size	Tires	Tubes
6.00-20	$3.75	$1.35
6.50-20	4.45	1.95
7.00-20	5.95	2.95

Size	Tires	Tubes
7.50-20	$6.95	$3.75
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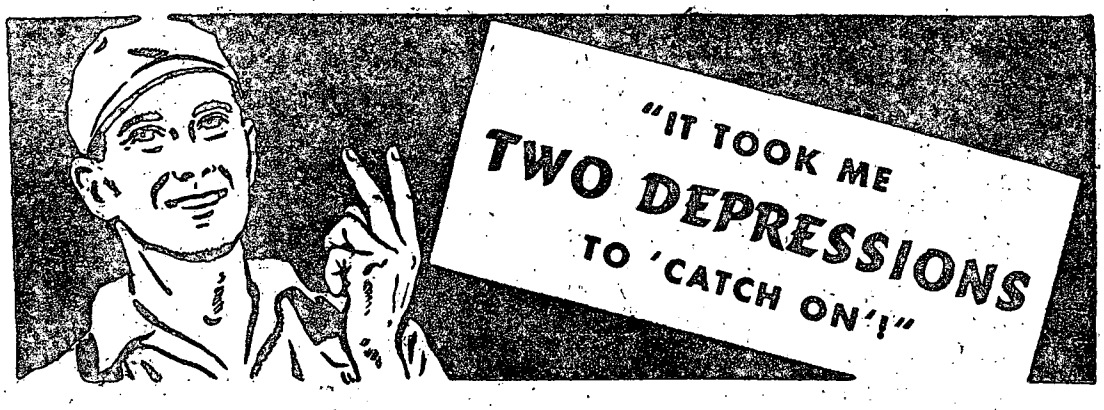

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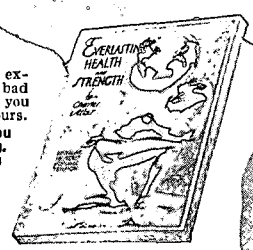

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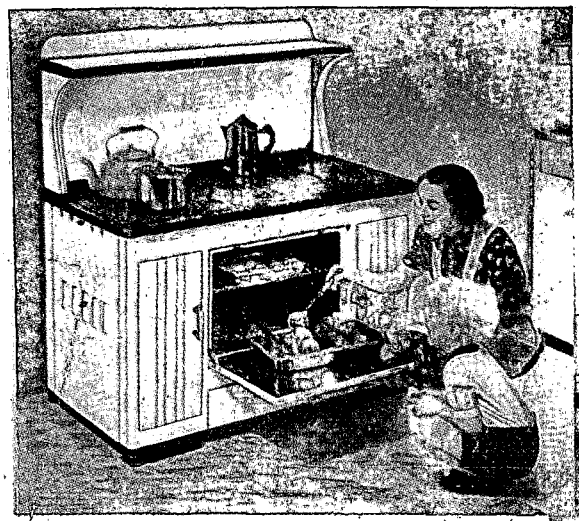

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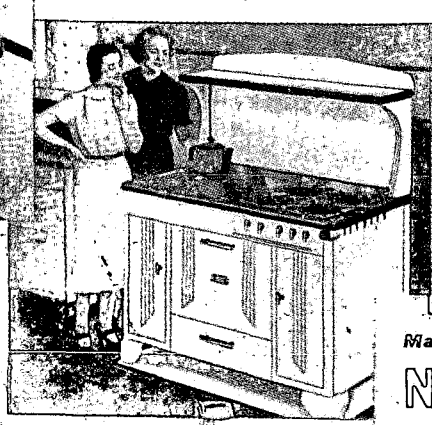

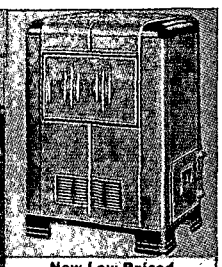

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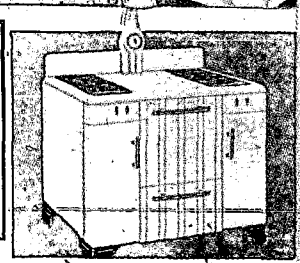

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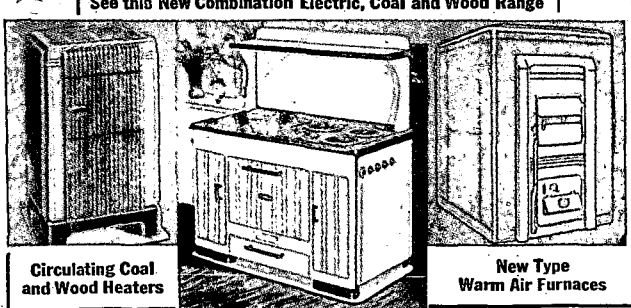

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